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JANUARY, 1906.

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TEXTILE WORLD RECORD

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The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Mercerizing Machinery for Piece Goods and Yarn in the Warp or Chain

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING
DYEING
DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Callenders for Moire Finish.

Sole Manufacturers of Patented Flexible Cloth Expander for Cylinder Drying Machines, Calenders, Mangles, &c.

Patent Combination Rolls Made of Cotton and Husk, especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

Estimates, Drawings and full particulars of complete plants furnished on application

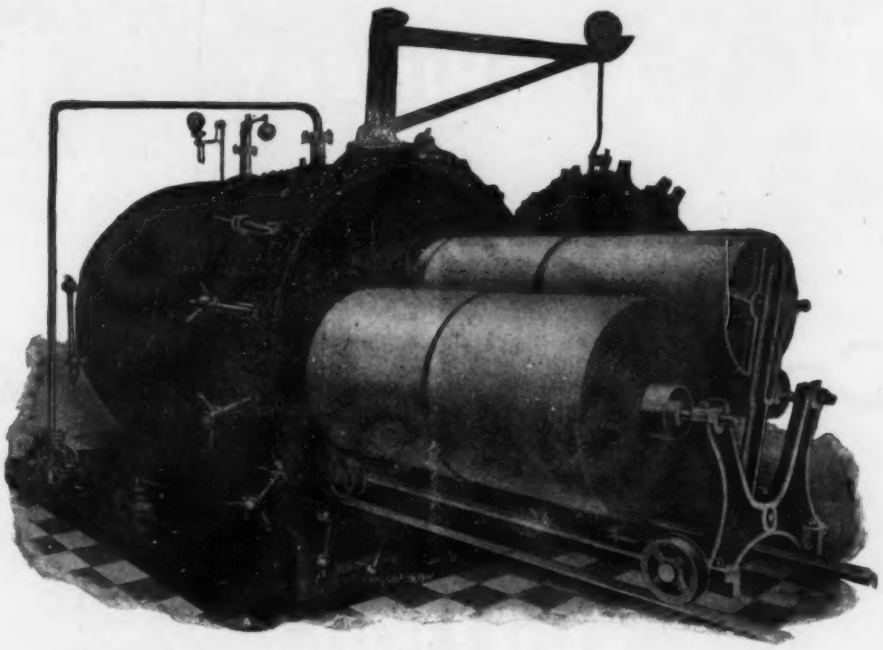
Southern Agent, STUART W. CRAMER, Trust Bldg., Charlotte, N. C., Equitable Bldg., Atlanta, Ga.

Open Bleaching System

OF

JACKSON & HUNT

Patented in the United States, Great Britain and the Continent
U. S. Patent, January 15th, 1901. No. 666,056



H. W. Butterworth & Sons Co.

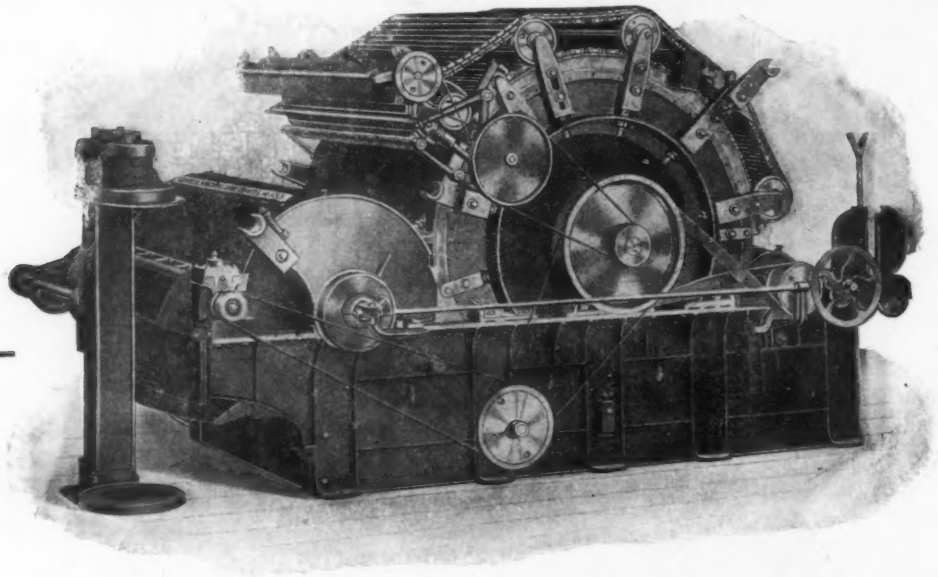
Manufacturers of

Bleaching, Dyeing, Drying and Finishing Machinery

YORK AND CEDAR STREETS

PHILADELPHIA

Sole Makers for the United States



Cotton and Worsted Machinery

With Modifications to Suit Any Class of Work.

Cotton Machinery: Cards, Railway Heads, Drawing Frames, Fly Frames, Speeders, Ring Spinning Frames, Twisters, Spoolers, Reels, Warpers, Slashers, Winders, Looms, Shearing Machines, Balling Machines, Folders, Stamping Machines, Sewing Machines, Size Pumps, Size Kettles, Drawing-in Frames, Baling Presses, Indigo Grinders.

Worsted Machinery: Spinning Frames with caps, rings or flyers, Dandy Rovers and Reducers, Cone Second Finishers, Reducers and Rovers, Gill Boxes for Drawing, Preparing and Finishing, Weigh Boxes and Drawing Boxes, Cap Trap, Flyer and Ring Twisters.

Plans, Specifications and Estimates furnished upon application.

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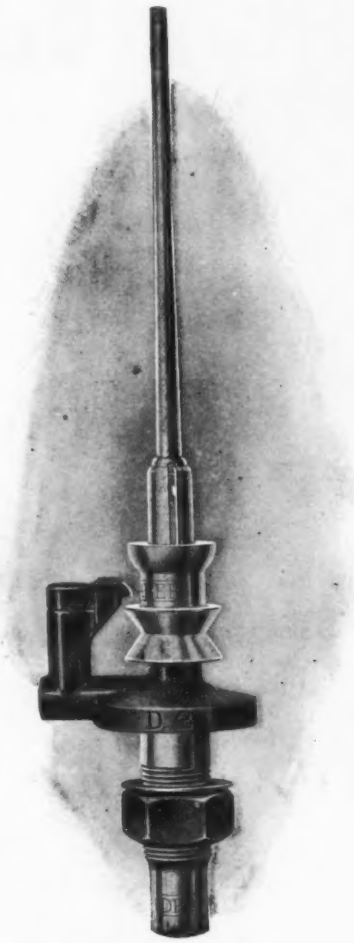
A New Spindle Improvement



The Rabbeth Centrifugal Bobbin Clutch.

Fits the Bobbin loosely when at rest—allows considerable variation in fit.

Bobbins will all go down into place and Traverse can be lengthened.

Allows easier and quicker doffing — stronger bobbins — less reaming.

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We Also Build Looms.

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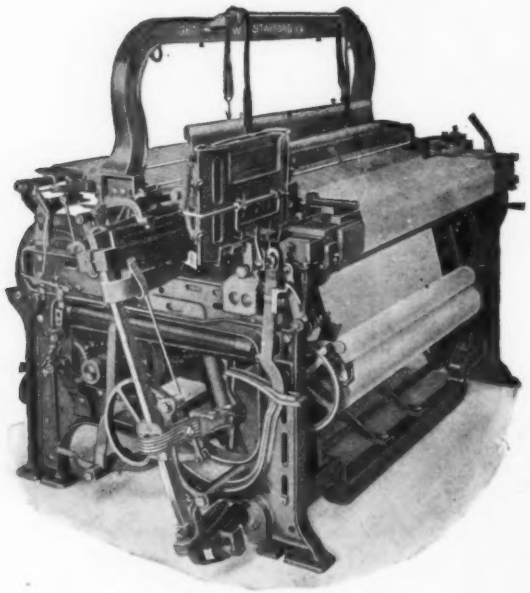

Ideal Automatic Loom

History Repeats Itself

Our previous successful efforts in the line of improvements in weaving machinery have culminated in our new

IDEAL AUTOMATIC LOOM

Considering quantity of goods produced per weaver, quality of goods, cost of supplies, repair bills, etc., there is no other loom can compare with it for economy of operation.

Cop or bobbin filling may be used equally well. One weaver can operate successfully from twelve to thirty looms, and under favorable conditions even more. No reduction in speed. A high grade plain loom as a basis.

Write for further particulars

Saco and Pettee Machine Shops

NEWTON UPPER FALLS, MASS., U. S. A.

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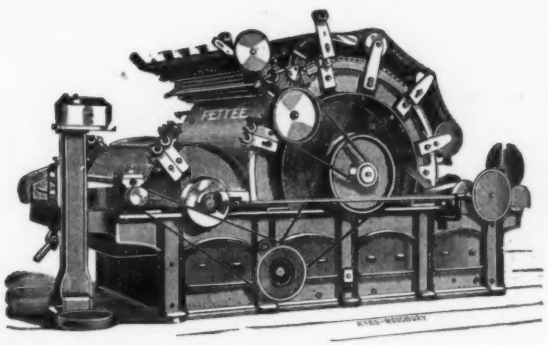

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REVOLVING FLAT CARDS,
DRAWING FRAMES,
RAILWAY HEADS,

SLUBBING,
INTERMEDIATE AND ROVING FRAMES,
SPINNING FRAMES,

SPOOLERS AND REELS.

Shops: { **Biddeford, Me.**
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THE

WHITIN MACHINE WORKS,

Cotton Machinery

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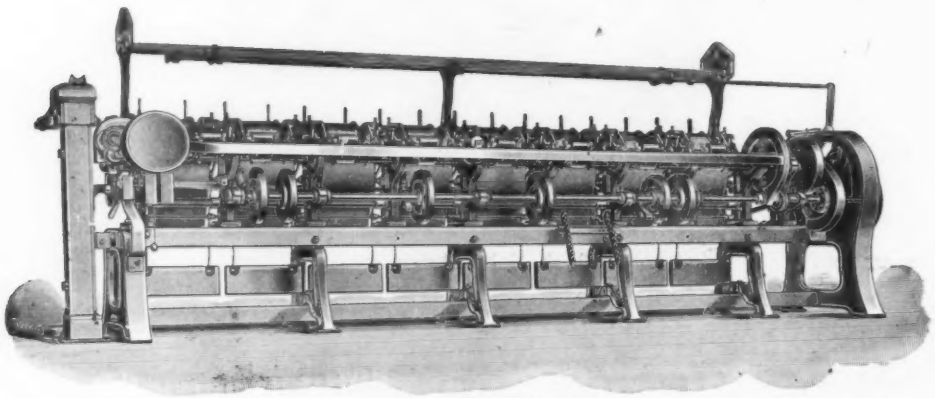

The Whitin 8 Head Comber.

Southern Agent, . . . S. W. CRAMER

Trust Building, CHARLOTTE, N. C.
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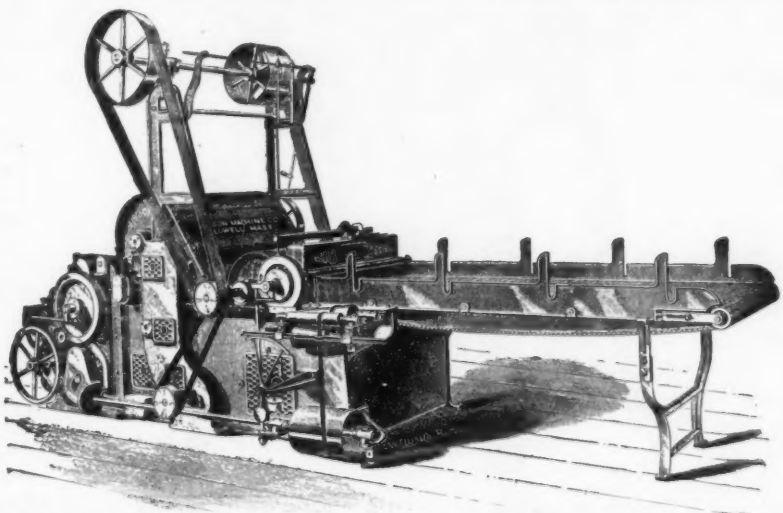
Revolving Flat Carding Engines,
Sliver Lap Machines,
Ribbon Lap Machines,
Combers,
Railway Heads,
Drawing Frames,

Spinning Frames,
Spoolers,
Twisters,
Reels,
Looms,
Long Chain Quilling Machines.

The Best Pickers

In the Cotton Field nothing equals the DARKY COTTON PICKERS.



In the Cotton Mill nothing equals the KITSON COTTON PICKERS.

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LARGEST BUILDERS OF COTTON OPENERS AND LAPPERS IN THE WORLD.

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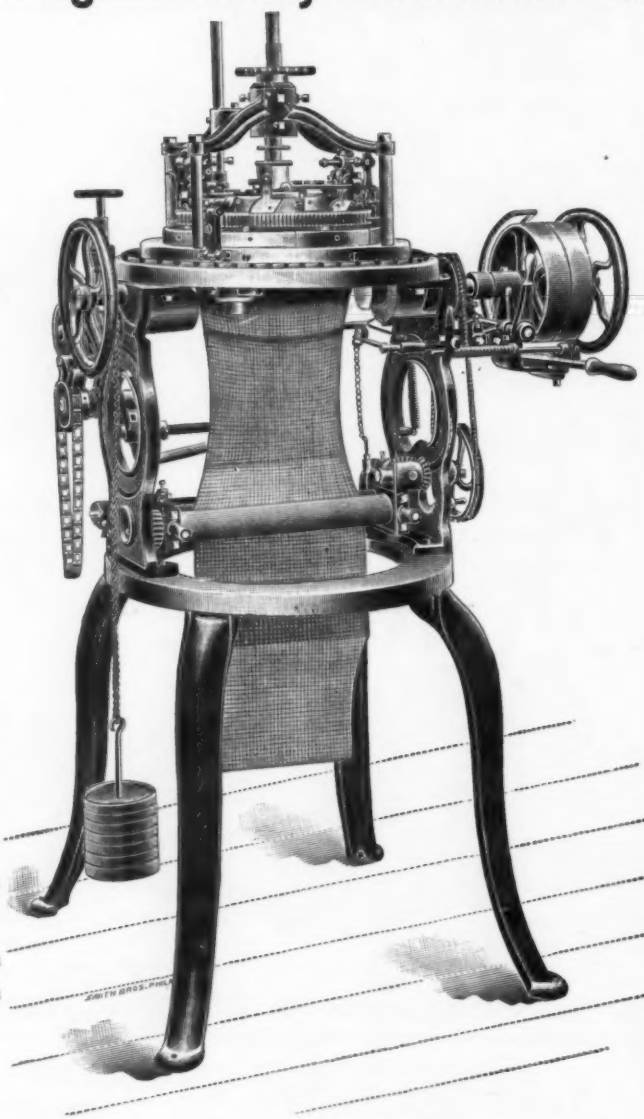
BUILDERS OF

Rib Knitting Machinery for Underwear and Hosiery

The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.



Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

Improved Measuring Device, by actual length knit.

Sizes, 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, four to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters etc.

We build Loopers, Ribbers and other Machinery for Knitting Mills

As well as

A Complete Line of Full Antomatic and 7-8 Automatic Seamless Hosiery Machinery.

Full Particulars, Samples and Special Catalogues on Application.

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Increases Production, Improves Quality, Decreases Labor Cost.

THE BRAMWELL SELF-WEIGHING FEEDER,

For Woolen, Worsted, Hosiery and Shoddy Cards and Garnett Machines.

We began introducing this feeder more than twenty years ago and its use is now practically universal. Many other types and makes have been tried and discarded, but the Bramwell, in its improved and up to date form, is now recognized everywhere as the most perfect feeder and only complete feeding machine in the world.

Our long experience has proved conclusively that where evenness is required—determined by weighing—our weighing feature is absolutely indispensable. Several attempts have been made to introduce feeding machines ignoring this principle, but none have succeeded.

We have made a careful study of all phases of the feeding problem and by adaptations and modifications of the Bramwell Feeder to meet the particular conditions, are prepared to feed evenly all kinds of stock from rabbit's fur to jute tow, including shoddy, cotton, fine wool, mixtures, fine and coarse worsted, flax tow, long worsted and all other kinds of stock.

THE APPERLY FEEDER,

For Second Breaker and Finisher Cards.

This machine was originally brought to this country and introduced against great opposition by the founder of this concern, the late Geo. S. Harwood. Today there are about 15,000 machines of our construction running in this country and Canada. We have greatly improved the machine. It is today an efficient, positive and up-to-date feed, and we can offer manufacturers the choice between the KEMP POSITIVE GEARED TRAVELER and the STANDARD TRAVELER with all other recent improvements.

THE BRAMWELL PICKER FEED,

For Burr Pickers, Mixing Pickers, Fearnaughts and Lumpers.

We consider our improvements in picker rooms of the utmost importance for up-to-date manufacturers. In fact, wide awake manufacturers are more and more realizing the wisdom of bringing their stock to the card room in a better state of preparation. Hand feeding is becoming a thing of the past in the picker room as in the card room. The latest Bramwell Picker Feed is built to handle all kinds of stock in any quantity with evenness and without injury to the staple.

THE SPENCER AUTOMATIC STOCK OILING MACHINE.

This is a modern device for oiling the stock automatically on its way to the picker from the BRAMWELL PICKER FEED, superseding the wasteful, dirty method heretofore in use. Because of the accuracy of this method and the fact that the oil goes on the stock only (instead of the floor and walls) there is a large saving of oil, and the stock is at the same time more evenly oiled and much better prepared for the carding process.

THE MODERN BRAMWELL FEED FOR WOOL WASHERS AND WOOL DRYERS.

The scouring and drying of stock is today recognized as a very important part of the manufacture of textiles, especially in worsted mills. Our feeds are recognized as the standard for properly feeding stock in the grease or wet stock with absolutely no injury to the staple, with evenness and in sufficient quantity and in the best possible condition for economical scouring. There have been other feeds offered for this class of work, but after clogging up and giving all kinds of trouble most of them are today in the scrap heap, having been replaced with our feeders.

THE KERSHAW WEB FEED AND WEB TRAVELER ATTACHMENT.

Where the stock being handled in a card room is so low and short that a drawing cannot be made without excessive twisting, even where the **Kemp Positive Geared Traveler** is in use on the **Apperly Feed,** then the Kershaw Web Feed is the best machine for the purpose ever put on the market. It takes the stock off the first or second breaker in a soft web about six inches wide and feeds it to the next card in the best condition for further carding. We are sole agents for New England.

REPAIRS AND IMPROVEMENTS FOR OLD FEEDERS.

We have not been standing still all these years and the feeders we are building today are modern and up-to-date but these improvements and attachments can be placed on older feeders of our construction, greatly to their benefit. We do not hesitate to claim that **no outlay will show a greater return** to a manufacturer than money spent in bringing your Bramwell and Apperly Feeds thoroughly up-to-date.

APRONS OF ALL KINDS FOR BRAMWELL FEEDERS.

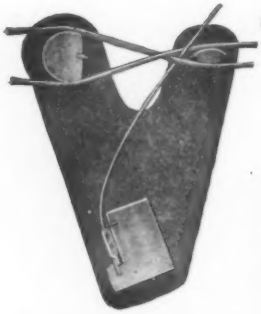
We build about thirty different styles of spike aprons adapted to the various kinds of stock BRAMWELL FEEDERS are called upon to handle. Our policy is and will be to put into our aprons the best materials and workmanship money can buy. We know we could make cheaper aprons by using cheaper materials and less expensive labor and it would take manufacturers some years to find us out. The apron would LOOK nearly as well but would WEAR only two or three years, instead of from five to ten or twelve. Do not trust the man who says he can sell you aprons cheaper than we can. He can do it (and so could we) but you pay the bill in the end. The best is none too good and is the cheapest in the long run.

Call on us for particulars and information about all matters relating to Feeding Machinery.

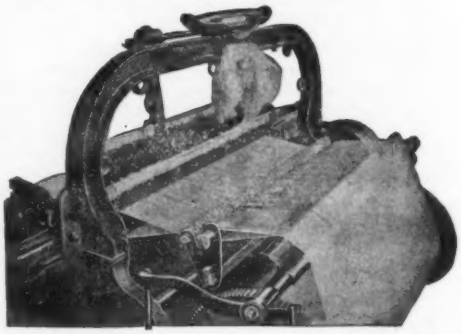
GEO. S. HARWOOD & SON,

53 STATE STREET, BOSTON, MASS.

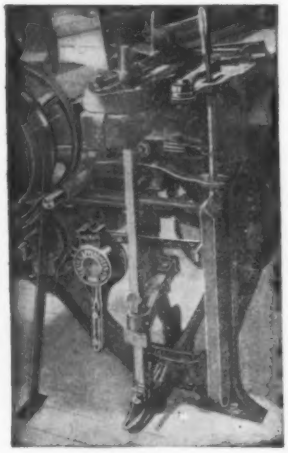
Absolute Efficiency from Bed-Rock Simplicity



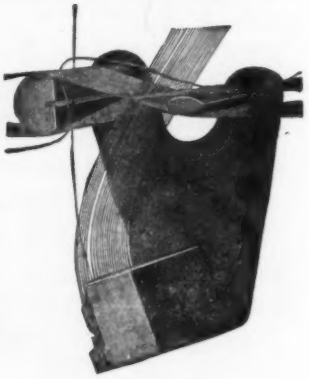
Our **WARP-STOP** controls
TWO threads by ONE spring WIRE, held in a COMB,
engaging the warp
in such a way that
the TENSION is
UNDER CONTROL,
and
ABRASION of the
yarn is AVOIDED.



The COMBS are RAPIDLY INSERTED, BEFORE or AFTER the warp is in the loom, and are carried in a bar suspended from **the LEASE-RODS** which **ARE NOT FIXED** to the loom side, but **FREE to take their proper positions, and ALLOW the NATURAL MOVEMENT of the WARP,** so that **the COVER of the cloth is UNAFFECTED.**



When a thread breaks the WIRE SPRINGS OUT from the comb, thus giving
a CLEAR SIGNAL of the place
of the BROKEN END,
and, by striking
a CONTACT SLIP upon which
LINT CANNOT COLLECT,
closes the circuit through



a PERFECT KNOCK-OFF, EASILY and RAPIDLY FIXED, and **actuated by a SPARKLESS current.**

American Textile Appliances Co.

WILLIAM FIRTH, Treasurer.

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EVAN ARTHUR LEIGH

232 Summer Street (opposite the South Station), Boston, Mass.

SOLE AGENT IN THE UNITED STATES AND CANADA FOR

Platt Bros. & Co., Ltd.

BY FAR THE LARGEST MAKERS IN THE WORLD OF

Cotton, Woolen and Worsted Machinery

Platt's Patent Opening and Picking Machinery.
Platt's Cotton Comber will comb from 7-8″ stock to Sea Islands.
Platt's Special Machinery for Making Cotton Waste into Yarns.
Platt's Special Machinery for Making French Worsted Yarns.
Platt's Woolen and Worsted Carding Engines, Special Designs.
Platt's Cotton, Cotton Waste, Woolen and Worsted Mules.

MATHER & PLATT, LTD.

Dyeing and Finishing Machinery. Archbutt-Deeley System for purifying and softening water.

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Flax, Hemp and Jute Machinery.

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Patent Feeding Machines for wool, cotton, flax, fur and fibrous material

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Looms for Worsteds, etc.

JOSEPH SYKES BROS., Card Clothing for Cotton.

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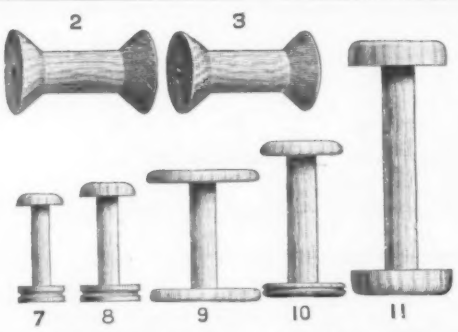
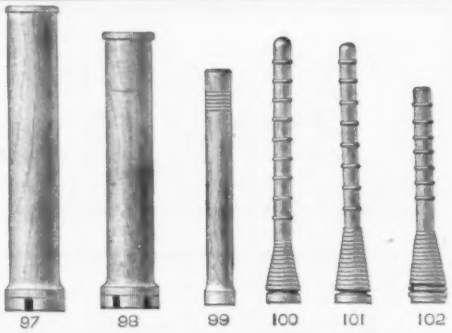
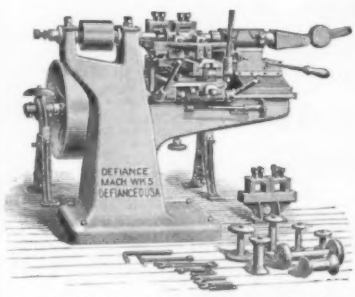
DRONSFIELD BROS'. Grinding Machinery and Emery Filleting.
The Best French and English Combing and Rubbing Aprons.
Harding's Pins and Circles, Varey's Fallers, etc.





SPOOL AND BOBBIN MACHINERY



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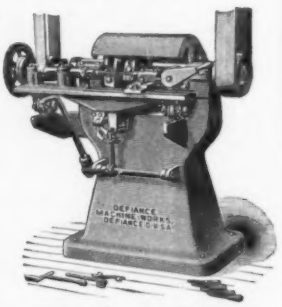
Complete Equipment
OF THE
MOST MODERN TOOLS
25% SAVED
Over the Old Methods
Send for Catalogue and Particulars to
THE
Defiance Machine Works,
DEFIANCE, OHIO



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Key Seating Attachment
FOR
Whiton Gear Cutter

We offer an attachment for use with our Gear Cutting Machine, to cut key seats for the Woodruff System of Keying. Write for description, circulars and price.

THE D. E. WHITON MACHINE CO.,
19 Oak Street, New London, Conn.

Rigid
Light
Un-breakable
Handy

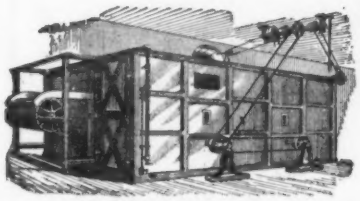
Low List
High Discount

Patented and Patents pending in the U. S. and foreign countries

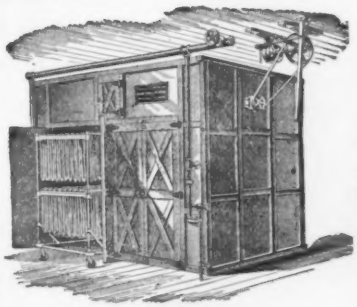
"American Pioneer"
Pressed Steel Shaft Hangers
are especially adapted for use in
TEXTILE MILLS
because the frames will not absorb oil, consequently lint will not stick to them
MANUFACTURED BY
Standard Pressed Steel Co.
Philadelphia, Pa.
For sale by supply houses throughout the U. S. and Canada.

"HURRICANE" DRYERS AND FANS

For WOOL,
COTTON STOCK,
YARN, STOCKINGS,
UNDERWEAR,
Etc.

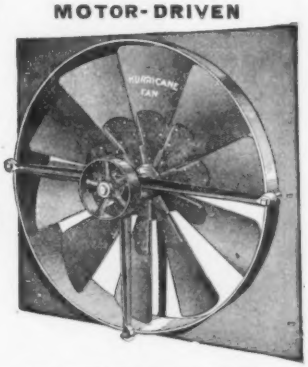


Cotton Stock and Wool Dryer.



Truck Yarn Dryer.

BELT-DRIVEN
MOTOR-DRIVEN



"Hurricane" Fan, Style No. 2.
Write for Catalogues.

CARBONIZING,
BLEACHING,
OXIDIZING, CHROMING and WASHING MACHINERY.

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6721 Germantown Ave., Philadelphia, Pa.

Fairbairn Lawson Combe Barbour, Ltd.

LAWSON BRANCH,

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MAKERS OF MACHINERY FOR

PREPARING AND SPINNING FLAX, HEMP, TOW AND JUTE

AND OF

Special Machinery for the Manufacture of Twines,

ALSO OF

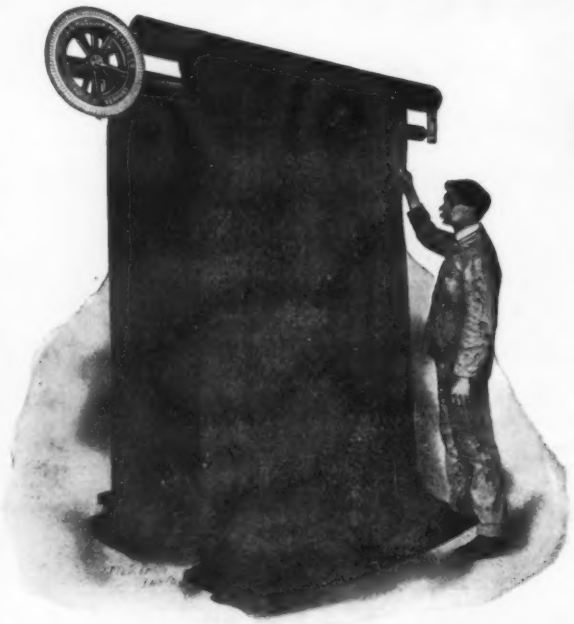
GOOD'S COMBINED HACKLING AND SPREADING MACHINE,
LONG REACH SCREW-GILL DRAWING FRAMES,
CHAIN-GILL DRAWING FRAMES with Apron Head,
PATENT HIGH-SPEED HORIZONTAL AND AUTOMATIC SPINNING FRAMES FOR MANILLA,

AND OTHER

Special Machinery for the manufacture of Rope Yarns and Binder Twine.

IMPROVED LAYING MACHINES. HASKELL-DAWES TUBING TWISTERS
BROWNELL'S PATENT TWISTING AND LAYING MACHINES FOR TWINE.

Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.



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PERCH CLOCK

100 Yards
All Numbered
Eighth Yards
Fixed Finger
Quick Reading

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Parks & Woolson Machine Co

Springfield Vermont

ANNOUNCEMENT.

We have purchased the Woolen Machinery Business of the

ATLAS FOUNDRY & MACHINE CO.
of Irvington, N. J.

(formerly at Newark and Belleville, N. J.), including all the machinery, tools, drawings, patterns, etc., used in the manufacture of the

Parkhurst Burr Pickers, Burr Cylinders, Feed Rolls, Atlas Mixing Pickers, Hair Pickers, Dusters, Feeders, etc.

We have also purchased the business of the

MILLER PRESS & MACHINE COMPANY
of Woonsocket, R. I.

builders of the **"Miller" Rotary Presses.**

The business of both concerns has been transferred to Worcester, where we shall continue to build the machines formerly made by them, in connection with our already large line of woolen and cotton machinery.
All correspondence and parts for repairs should be sent to us at Worcester, Mass.

Curtis & Marble Machine Co.

builders of Wool Dusters, Burr Pickers, Wool Pickers, Fearnaught Pickers, Steel Ring Burr Cylinders and Feed Rolls, Gigs, Nappers, Single and Double Shearing Machines, Brushing Machines, Wet Rolling Machines, Tacking Machines, Worsted Pumicing Machines, Dewing Machines, Steam Lustering Machines, E. Gessner and Miller Rotary Presses, Flock Cutters, Gas Singeing Machines, etc., etc.

WORCESTER, MASS.

July, 1905, with a business growth to such an extent that more room is absolutely necessary.

At your service if you will

Call or write and I will

Oblige you with information of details and practical results on

Bobbin and cop winding and other machinery that is manufactured here and

Kept in touch with the requirements

Always producing the work that is correct,

Letting nothing go out

That is not satisfactory before delivery.

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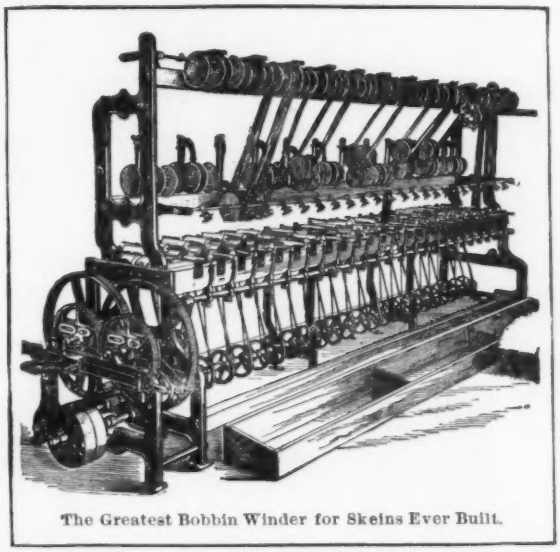

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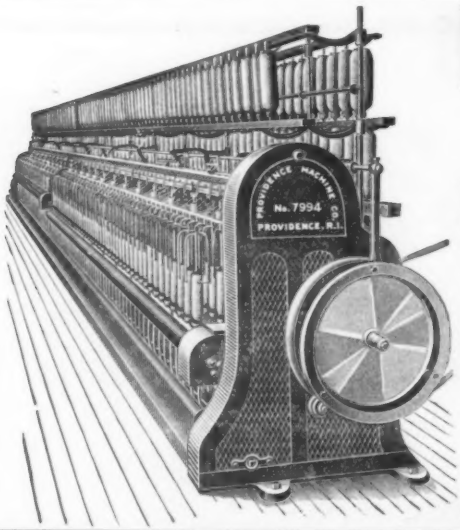

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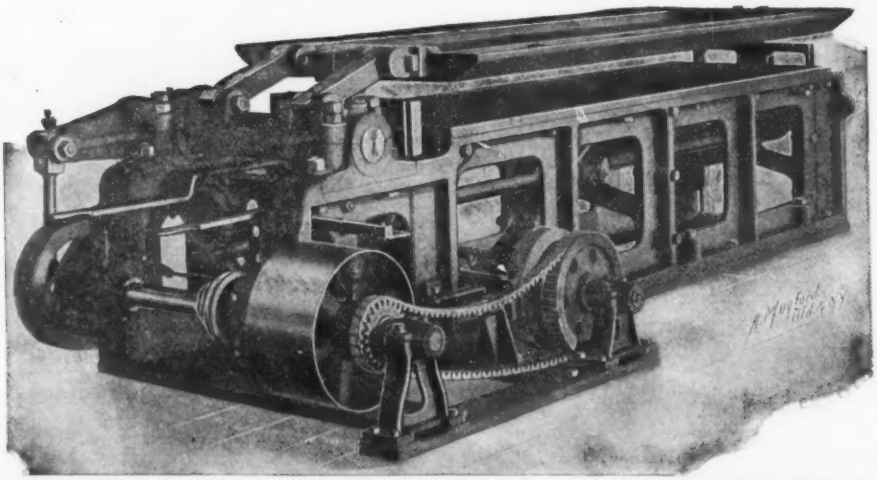

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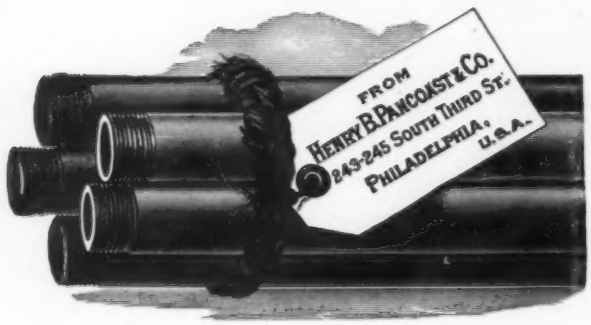

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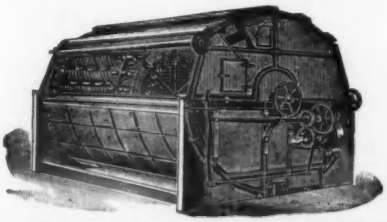

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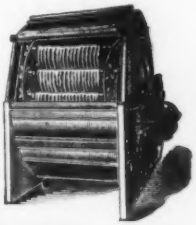

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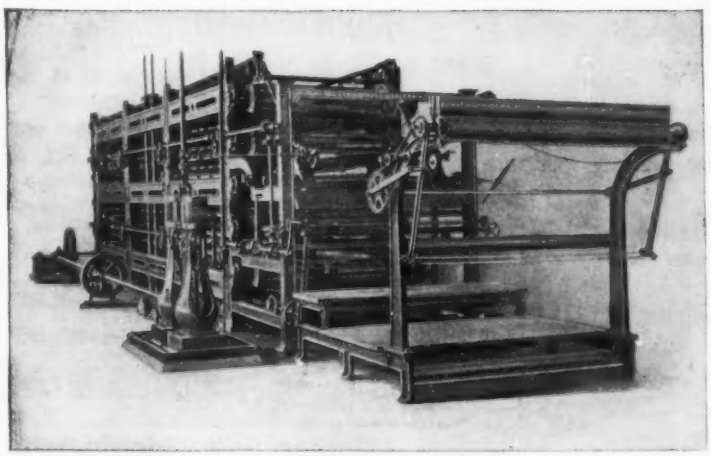

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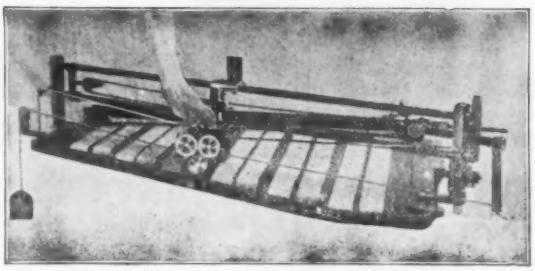

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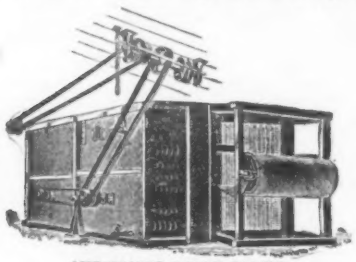

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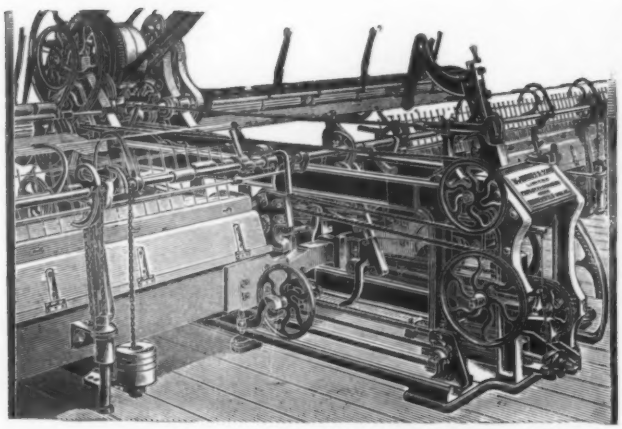

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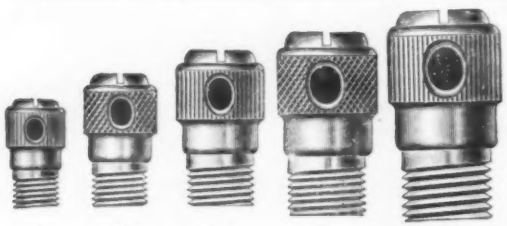

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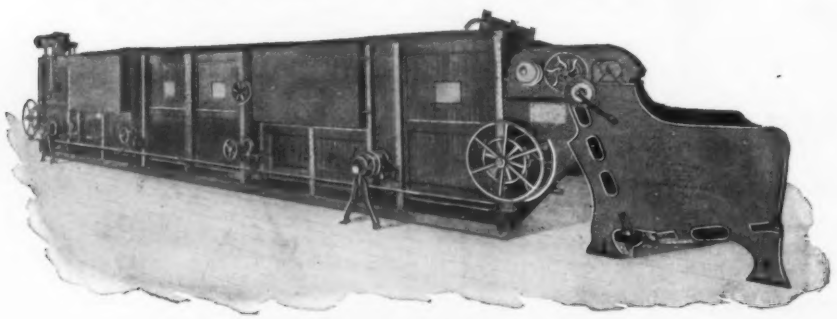

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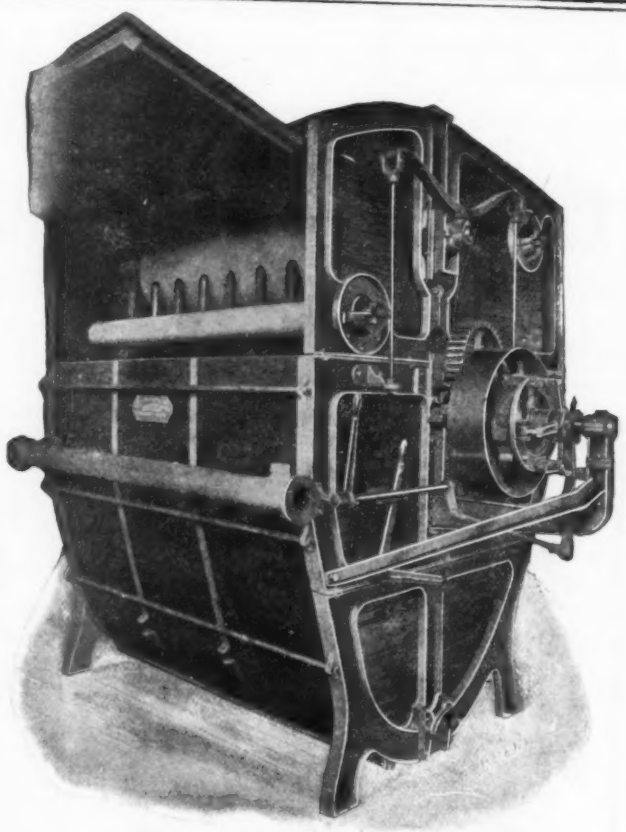

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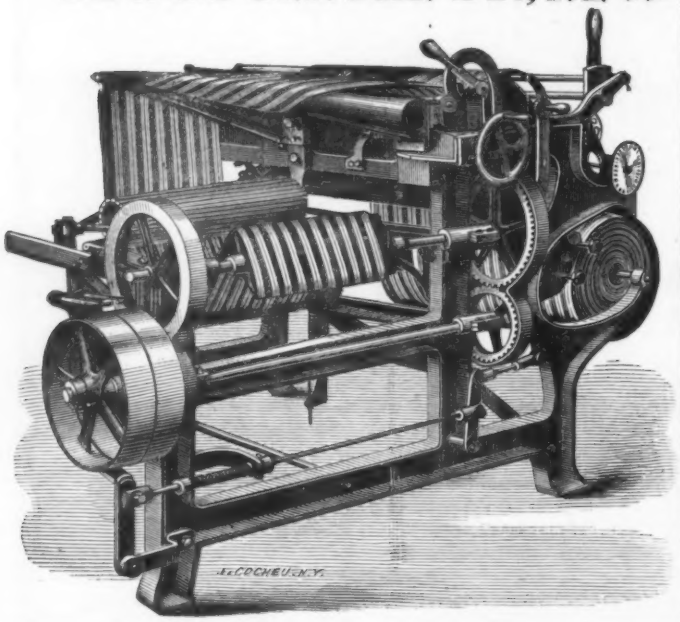

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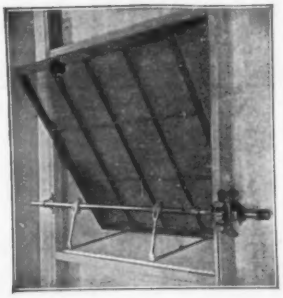

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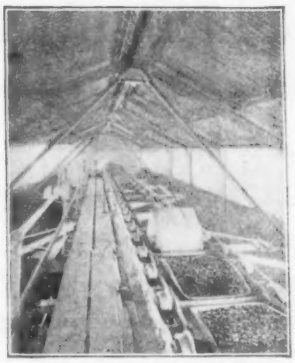

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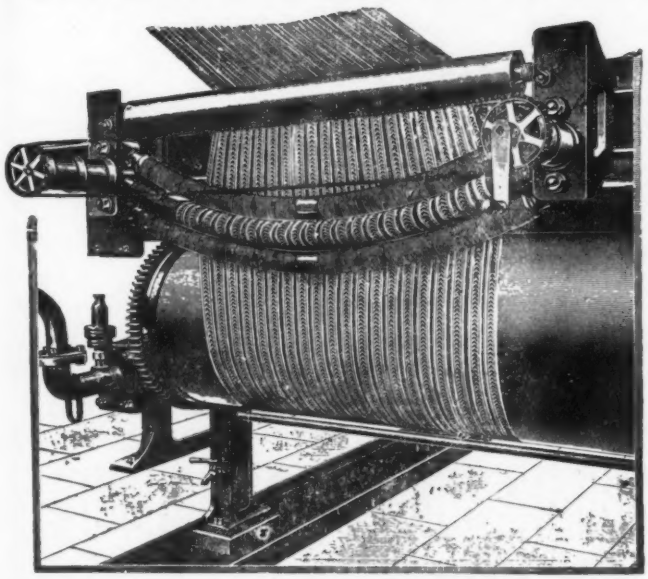

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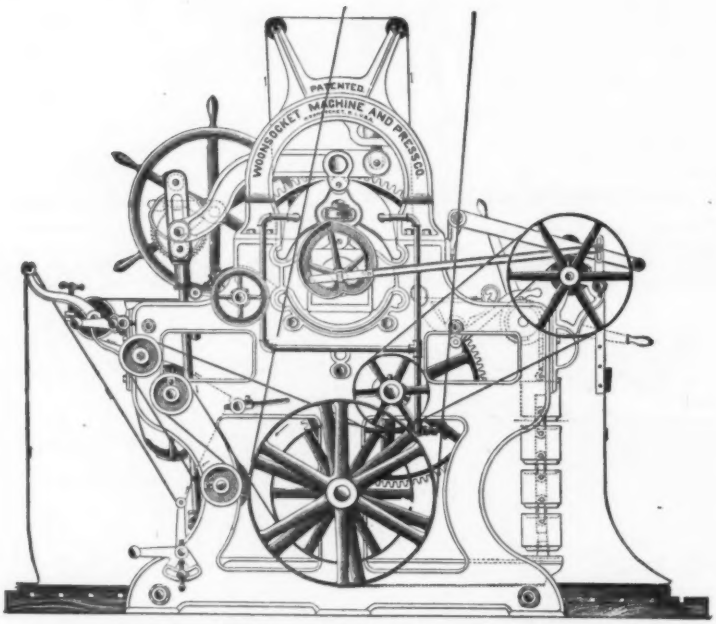

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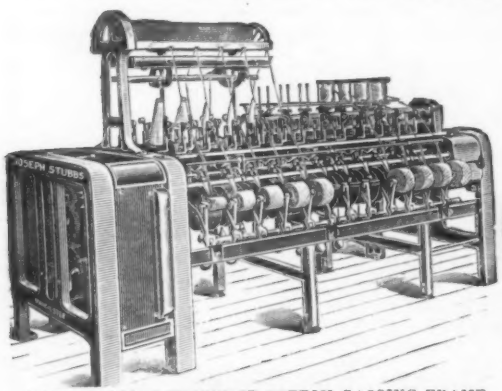

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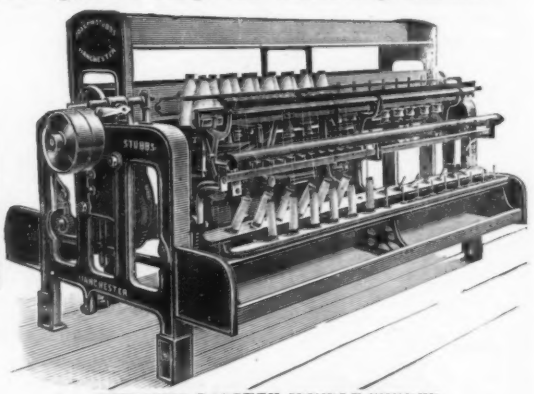

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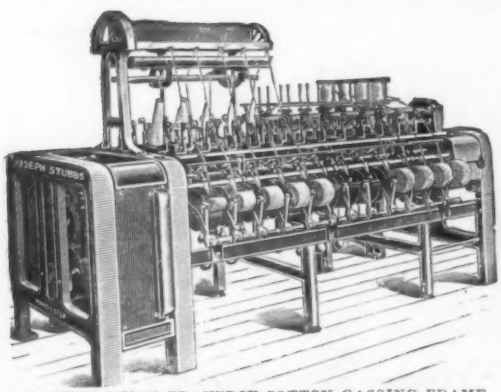

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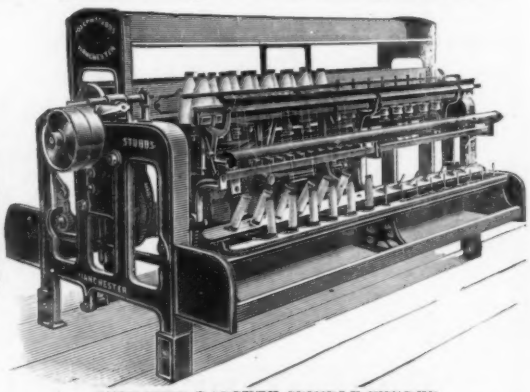

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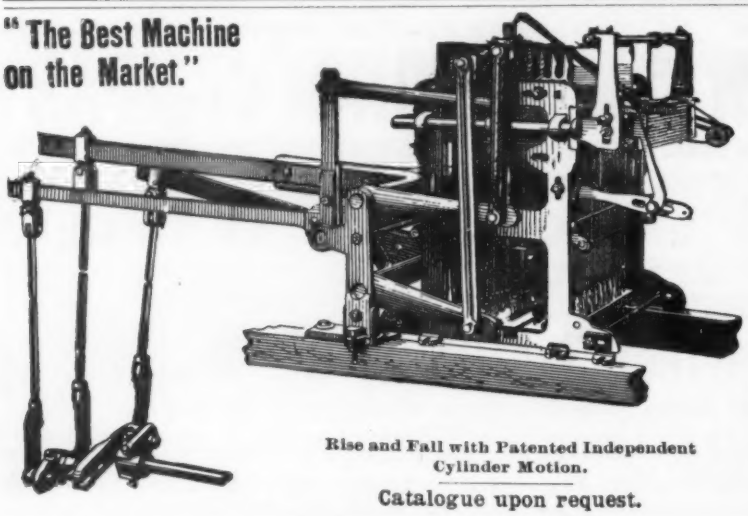

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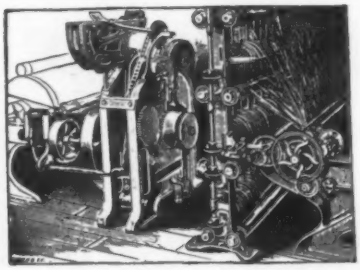

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With all the latest improvements for Wool Cards. The latest and best and only Feed that will make yarn positively even.

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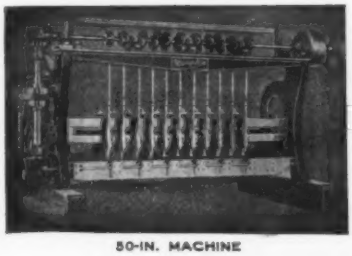

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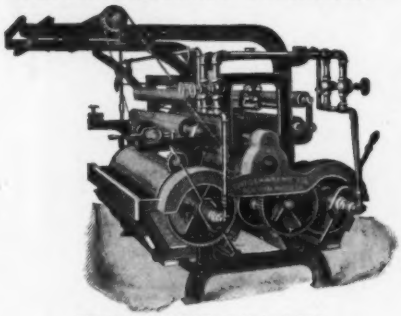

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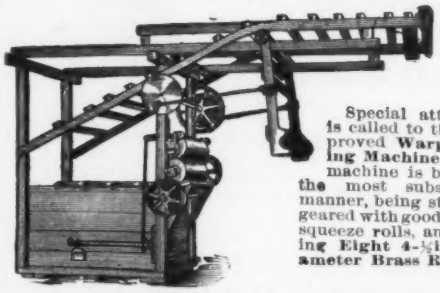

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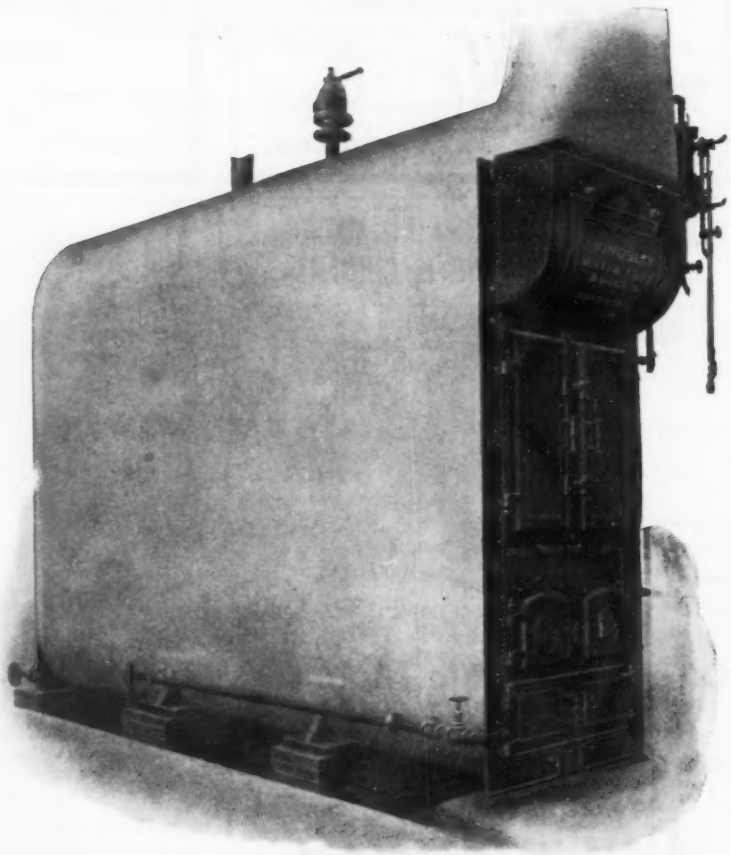
Built in Units from 100 to 350 H. P. for working steam pressure up to 200 lbs.



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Space occupied 15 ft. x 14 ft. x 6 ft. 2 in.

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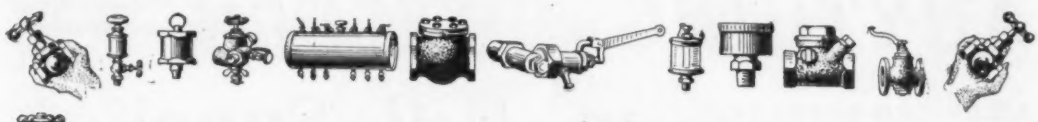

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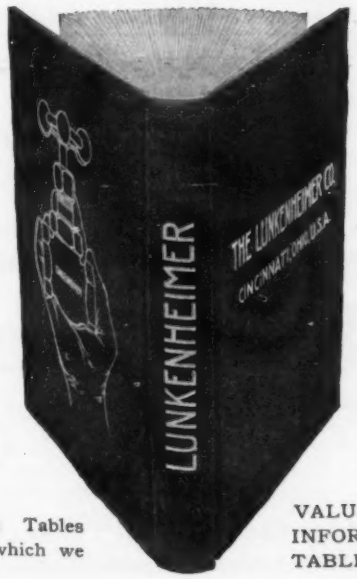

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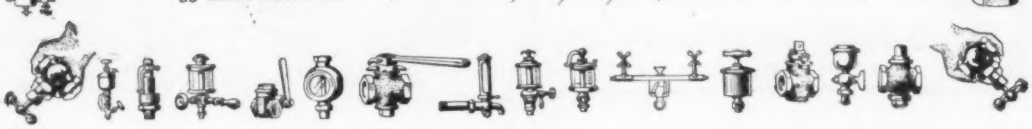

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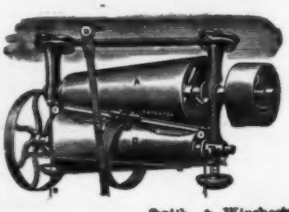

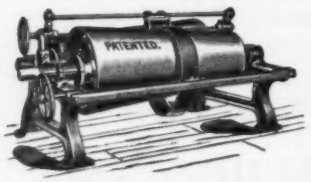

Smith & Winchester Co., So. Windham, Conn., 250 sets. Furguson & McRae, Belfast, Ireland, 25 sets. Mercantile Laundry, So. Windham, Conn., 230 sets. Washburn & Moen, Worcester, Mass., large number, all sizes. Dennison Tag Co., Boston, Mass., large number, small sizes. Saco & Pettee Machine Co., Newton, Mass., 275 sets. Pacific Mills, Lawrence, Mass., 15 sets.

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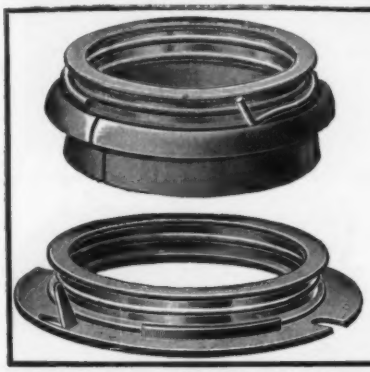

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Needs no covers,
Will not split or warp;
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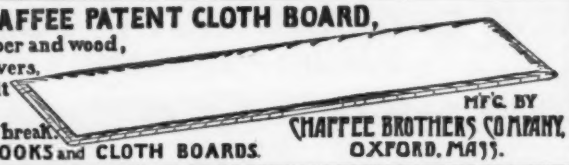

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for WOOLENS, WORSTEDS, FELTS, etc.

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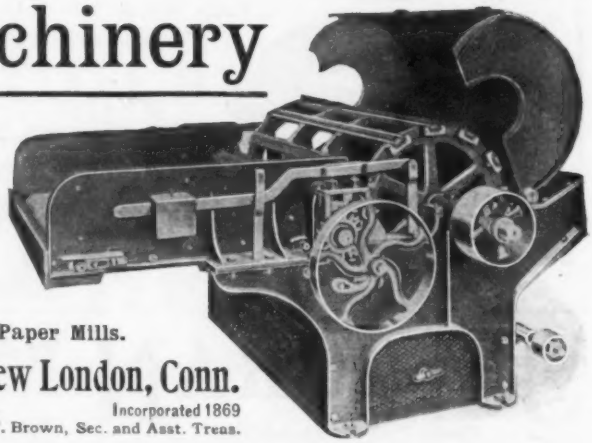

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Steel Ring Double Burring Machines
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Self Feeds for Burr Pickers, Mixing Pickers, etc.

Mill and Machine Brushes, for Textile, Paper Mills.

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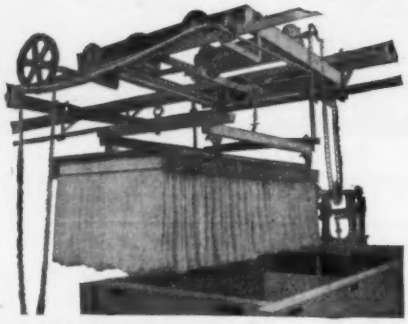
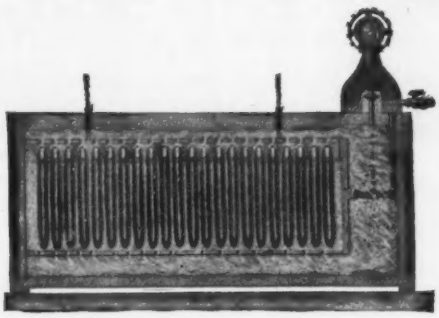


This illustration shows our Compressed Air Hoisting Carriage, with 300-pound Yarn Machine suspended.



Longitudinal Sectional View, showing the circulation of dye-liquor through the yarn when in operation.

Points of Superiority Which We Claim for the Hussong Machine.

Durability, Even Dyeing, Saving of Steam, Saving of Dyestuff,
Saving of 75% in Labor. Makes No Waste Whatever. No Friction on the Material,
Requires but Little Power to Operate,
Leaves the Yarn and Slubbing in its Natural Condition.

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leave no marks after bleaching. Contain no aniline dyes. Are made in ELEVEN colors.
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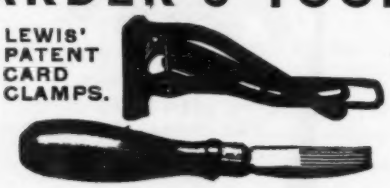

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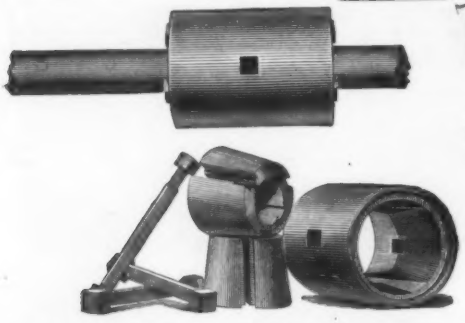

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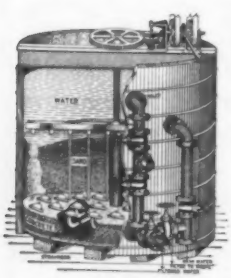

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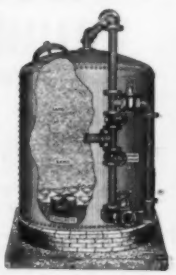

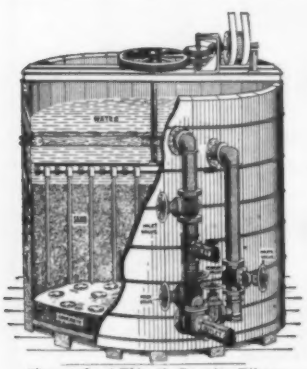

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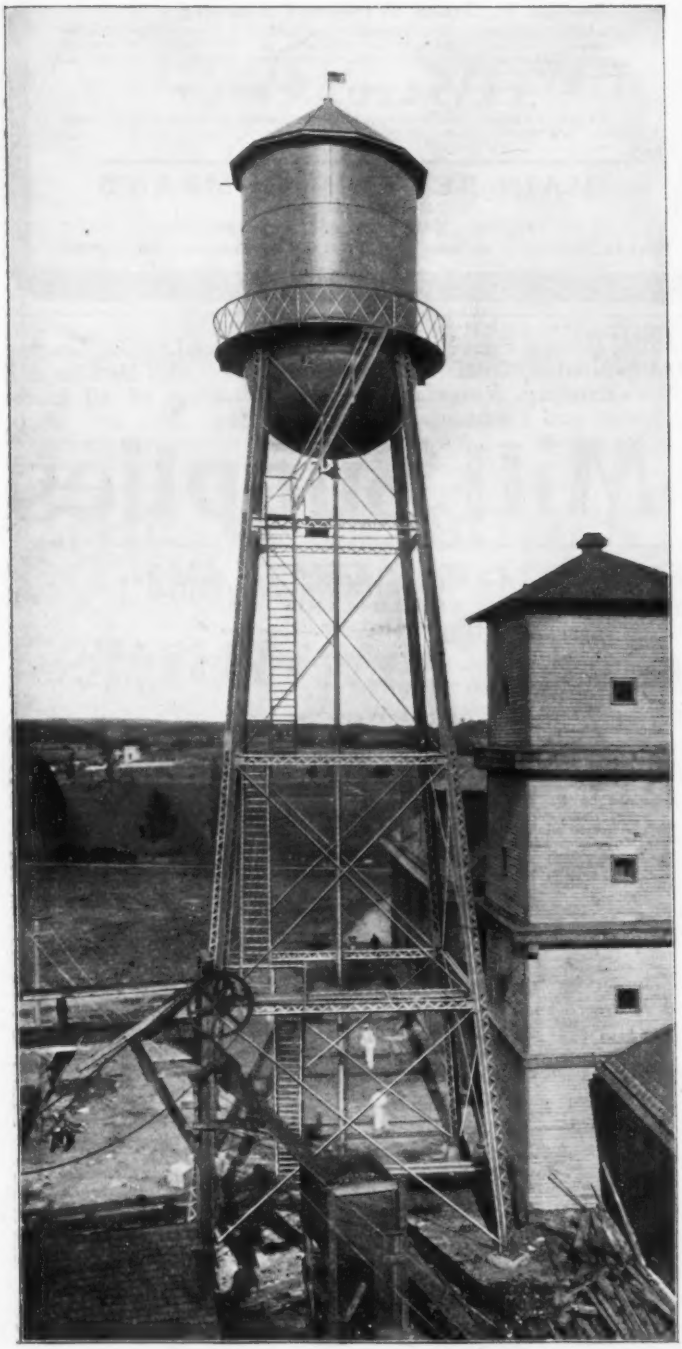

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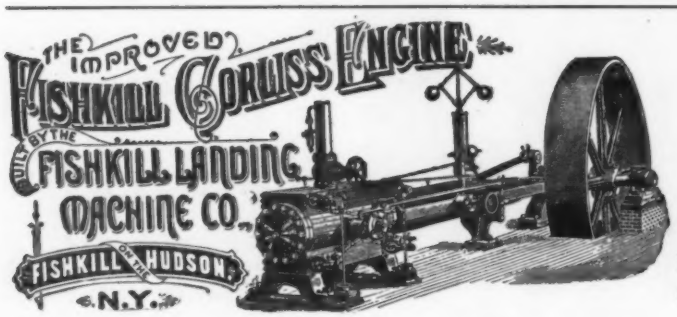

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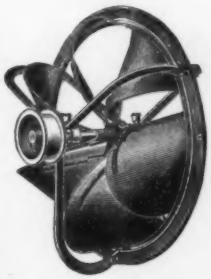

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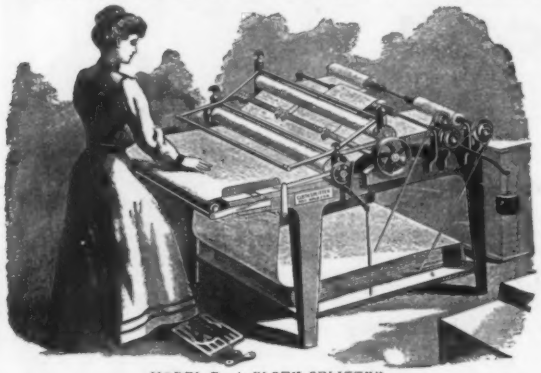

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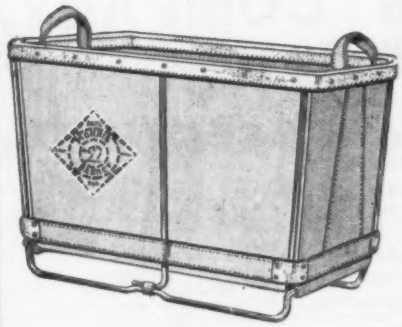

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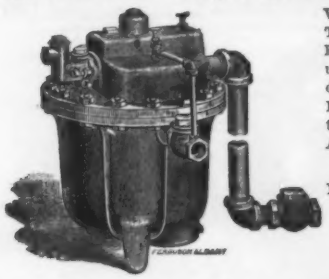

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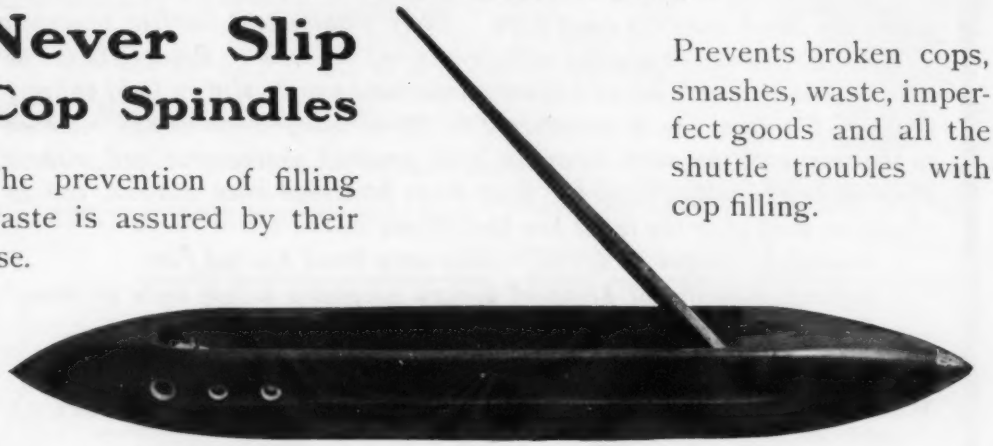
Prevents broken cops, smashes, waste, imperfect goods and all the shuttle troubles with cop filling.



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- Cannot Shake Loose with the vibration of the frame.

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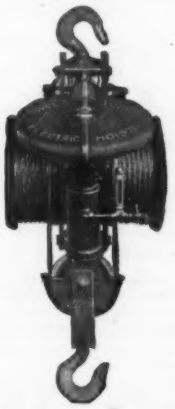

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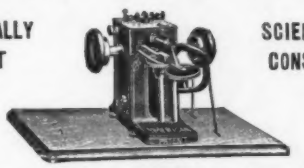

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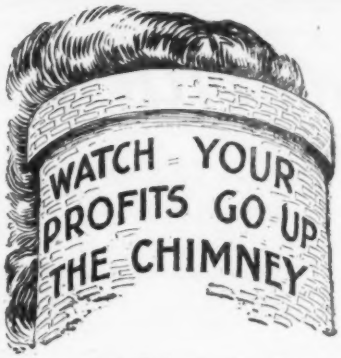

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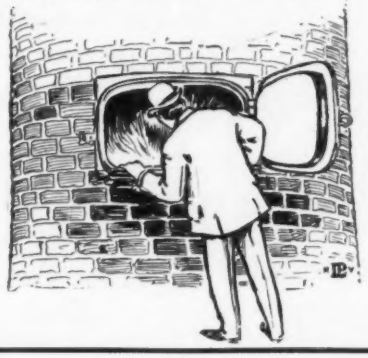

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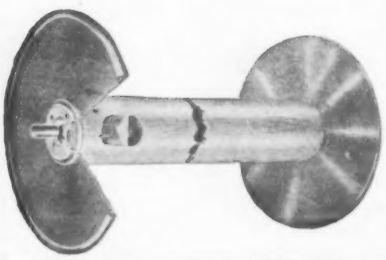

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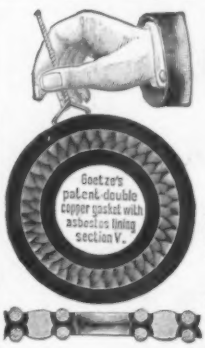

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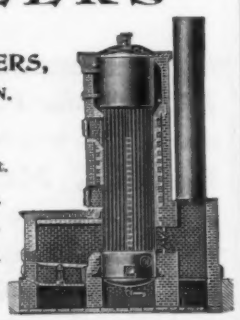

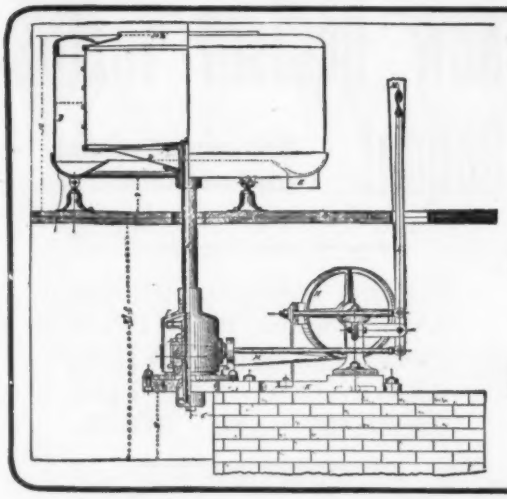

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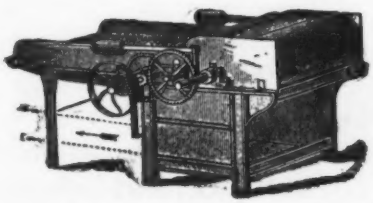

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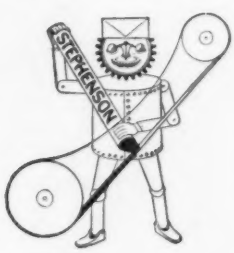

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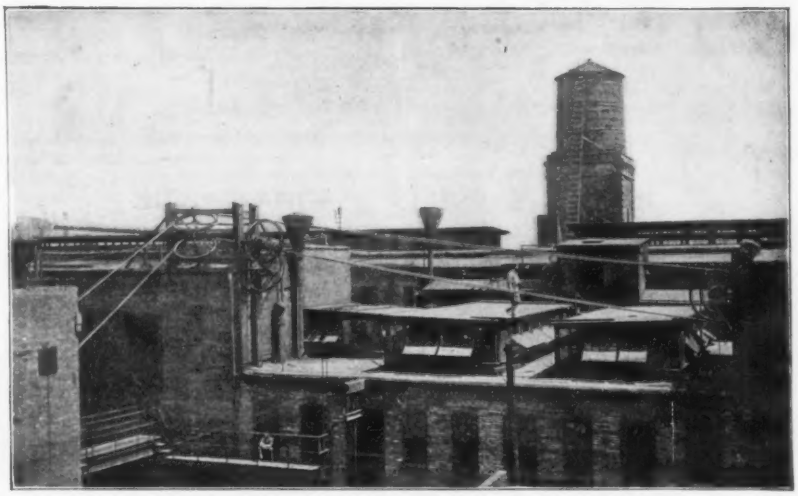

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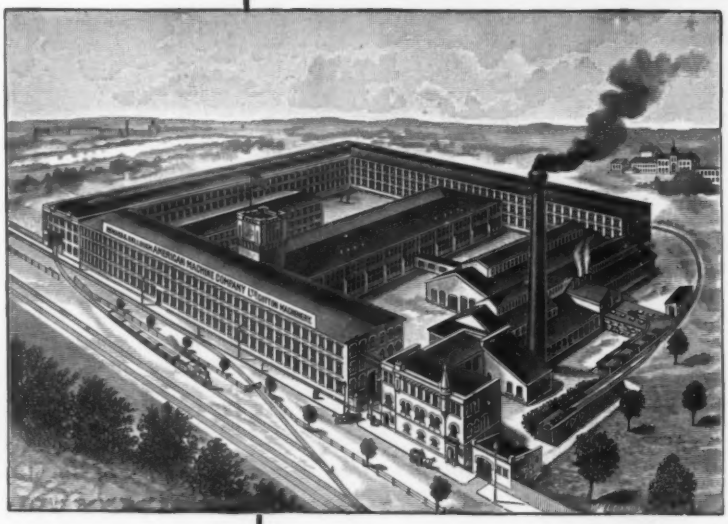

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Monthly Comment.

How the Sliding Scale Slides.

The operation of the sliding scale in the cotton mills of Fall River from its adoption in October to the end of 1905 is shown by the following table:

Week ending	Middling Uplands	28-inch 64×64	38½-inch 64×64	Margin	Wage premium above 1Sc per cut ¢
Oct. 27....	10⅜	3¾c	4¼c	.77	5
Nov. 3....	10.8583	3¾c	4.8958c	.757	3
10....	11.61	3¾c	5c	.714	0
17....	11.28⅛	3¾c	5c	.74	2
24....	11.43⅛	3¾c	5.041c	.735	1
Dec. 1....	11.80	3¾c	5.15c	.752	3
8....	12.35⅝	3¾c	5¼c	.724	0
15....	12.20	3¾c	5¼c	.7502	3
22....	12.19⅛	3¾c	5¼c	.7376	1
29....	11.99	3¾c	5¼c	.7537	3

The Wage Increase in Textile Mills.

The initiative taken by the American Woolen Co. last month in granting an increase of 10 per cent. in the wages of the operatives shows not only the ability with which that company is managed, but furnishes additional evidence of the prosperity of the country and the scarcity of the unemployed. The success of a manufacturing plant depends on obtaining a large production by operating the machinery at its highest efficiency. This can be accomplished only by having enough of the right kind of help to do the work.

A large part of the cost of manufacturing consists of fixed charges which vary but little whether the mill is run to its full capacity or not. Some of the items of these charges are actually fixed, such, for example, as insurance, taxes, salaries and the wages of overseers; others can be reduced slightly when part of the machinery is idle. The result of a drop in the production is, consequently, an immediate increase in the cost of the goods, which quickly converts a prospective profit into an actual loss. This fact is well known, but will bear repetition because it is of vital importance to every manufacturer, regardless of the class of goods produced. It has been illustrated on a large scale in the cotton mills of Lancashire during the last two years. The enormous profits now being made by English spinners and manufacturers are the result largely of their ability to operate the machinery at its highest efficiency.

During the enforced short time in 1904, the other phase of the problem was illustrated and the losses then were due in great measure to the increase in the cost of production, resulting from a decrease of production. The case was thus stated by John P. Dixon, a leading manufacturer of Manchester, before the Chamberlain Tariff Commission:

> "One thing is absolutely certain in all industries, but particularly in the cotton industry, that if you are to produce cheaply you must run your machinery full time."

Another spinner and manufacturer sup-

plied the commission with a comparative statement compiled from his books, which showed that a decrease of 37 per cent. in the production was accompanied by an increase of 58 per cent. per yard for fixed charges.

In this country the same law of production and cost was illustrated on a large scale during the hard times from 1893 to 1900. We have before us the records of a large worsted mill which show that a decrease of 37 per cent. in production in February, 1897, was accompanied by an increase of 22 per cent. in the cost per yard for labor alone. These illustrations show the necessity of securing a full production. It is for this reason that the mills that increased wages 10 per cent. last month may find the cost of their finished product reduced by the operation.

Textile Products in our Foreign Trade.

Twenty-eight per cent. of the foreign commerce of the United States in the year ending last June consisted of textile products. The proportion was practically the same for both exports and imports. The total foreign trade consisted of imports, $1,117,512,629, and exports, $1,491,744,695. Of this textile products are credited with imports, $295,587,852, and exports, $440,502,522, classified as follows:

	Imports.		Exports.	
	Raw material.	Manufactures.	Raw material.	Manufactures.
Cotton.....	$10,656,624	$48,919,936	$381,398,939	$49,666,080
Wool.....	46,225,558	17,893,663	15,008	2,035,054
Silk	61,040,053	32,614,540	.....	620,572
Linen	2,260,421	15,565,808	.....	.....
Hemp, jute..	35,851,651	24,559,598	.....	6,766,809
Total.....	$156,034,307	$139,553,545	$381,414,007	$59,088,515

Practically all of the raw material shipped from this country consists of cotton in the production of which the United States has a practical and permanent monopoly. The future course of this branch of our export trade depends upon two factors. First the increasing requirements of the domestic mills which will tend to reduce the amount of cotton available for export; and second, the increase in the price due to the demand for cotton increasing more rapidly than the supply, which will tend to increase the total value of exports and thus compensate for any shrinkage in the quantity. The textile exports consist chiefly of cotton, hemp and jute goods, and it is in these lines that any increase may be expected.

Forty per cent. of the raw materials imported consist of raw silk, which, owing to the conditions both here and in Asia, is not likely to become an American product. The case is different with wool, which forms nearly one-third of the total imports of raw materials. The high prices now prevailing are likely to stimulate the domestic production, and thus reduce the quantity of wool imported. The imports of cotton, consisting chiefly of Egyptian, are likely to continue in order to supply the deficiency of the supply of cotton for fine yarn. The products of our domestic linen mills in 1900 were valued at $4,368,159, but the extent to which they fall short of supplying the domestic demand is shown by the imports of $15,565,808 of linen goods in 1905.

Short Time and Mill Building.

When the Cotton Congress at Zurich was discussing short time in cotton mills last year, as if it were the only efficient remedy for high-priced cotton and low-priced goods, Herr Prowe, the delegate from Russia, rose and asked the following question:

Would it be worth consideration to suggest the possibility of guarding against over-production by prohibiting the erection of new spinning mills.

Apparently the suggestion was not deemed worthy of consideration, for the Russian received no reply. His was the voice of one crying in the wilderness. Events, however, have quickly justified him, for today an agitation has been started in Lancashire against the floating of new mill enterprises and against the methods by which the new companies are organized and managed. The Federation of Employers is being called upon to take measures to prevent the floating of mills, which has during the past year added 5,000,000 new spindles in Lancashire.

In the reign of Charles II. it was enacted that "no forreign Wooll-cards, or forreign Card-wyer, or Iron wyer for making Woollcards shall be imported into England or Wales upon forfeiture of the same or the value thereof."

A Proposed Revision of the Tariff.

The congressman from the twenty-fifth New York district, the Hon. Lucius Nathan Littauer, of Gloversville, who is a textile (glove) manufacturer, introduced into the House of Representatives last month a bill that deserves attention because, if it becomes a law and is to be enforced, a revision of the Dingley tariff law will be necessary. The Littauer bill is as follows:

"Section 1. That from and after the first day of July, 1908, all of the departments of the government of the United States in transactions requiring the use of weights and measures, shall employ and use the weights and measures of the metric system."

Practically all the textile schedules of the Dingley bill are based on weight and measure, either directly in the case of specific duties, or indirectly by classification. The effect of the Littauer bill on these schedules can be illustrated by applying it to, say, one item of paragraph 305, Schedule 1, which relates to cotton manufactures. The first item in this paragraph is as follows:

"Cotton cloth not bleached, dyed, colored, stained, painted, or printed, exceeding 50 and not exceeding 100 threads to the square inch, counting the warp and filling, and not exceeding 6 square yards to the pound, 1 1/4 cents per square yard."

Translating this to the Littauer basis in accordance with the law of 1866, which gives the equivalents of the metric units in terms of our fundamental English weights and measures, we have the following:

"Cotton cloth not bleached, dyed, colored, stained, painted, or printed, exceeding 19.685 and not exceeding 39.37 threads to the square centimeter, counting the warp and filling, and not exceeding 11 179/2990 square meters to the kilogram, 1.495 cents per square meter."

Among the reasons why these Littauer metric rates would have to be raised or lowered before they could be assessed on imports are the following:

First, the expressions are too cumbersome for practical affairs.

Second, they would in many cases necessitate such impossible measurements as 0.685 and 0.37 of a thread, as in the case cited.

Such absurd expressions as "11 179-2990 square meters," which the Littauer bill would bring into our tariff law, cannot be simplified by further reduction to decimals because they have no decimal equivalents either in fact or in legal fiction, and the executive officers of the government have no constitutional authority to change the law.

The assessment of the Dingley duties under the Littauer bill would thus be extremely difficult or impossible, and, consequently, the enforcement of that bill would necessitate increasing or reducing the Dingley schedules to bring the metric rates where they could be applied to imported goods. A faint idea of the technical difficulties of such a readjustment can be obtained by recalling that the textile and glove schedules of the Dingley tariff alone include one hundred paragraphs; that the entire tariff bill includes four hundred and sixty-three paragraphs, exclusive of the free list; and that the case cited above refers to but one item in one paragraph in the cotton schedule. The industrial and political effects of such a revision need not be emphasized here.

This Littauer bill has evidently been framed on the assumption that it is a theory and not a condition that confronts us. We venture to suggest that foresight is better than hindsight, and that if the bill becomes a law it will be a condition and not a theory with which the public, the customs officers and the courts will have to deal.

International Cotton Statistics.

Last month we referred to the plan of the International Cotton Federation for compiling statistics of the consumption and stocks of cotton in European mills, as follows:

A firm of Manchester accountants is charged with the duty of compiling the reports from the various mills and is pledged under oath not to reveal the details but to give out only the summarized totals as the committee may direct. It was decided at Paris that the official summary of the reports should be mailed at Manchester at such times as will enable them to be received simultaneously in the different countries. Presumably the reports to the more distant localities, Russia, for example, are to be mailed first; those to the mills in Lancashire last. It is evident that even with the exercise of the greatest care in calculating the probabilities of transportation by mail, the reports will fall far short of reaching all the participants in the plan at the same time. The difficulty arises from the restriction of the information to those making the reports. Moreover, it is not at all likely that the summarized reports can be kept secret, and the information will probably be public property before a considerable proportion of the participants have received the official advices mailed at Manchester. All these difficul-

ties would be avoided by having the statistics for all cotton mills compiled in Europe, as in America, by the governments of the respective countries, and announced simultaneously for the benefit of all.

On December 7, while the issue of this magazine from which the above extract is taken, was on the press, the first report of this cotton census was published in the Manchester Guardian. The next day the Guardian published a letter signed by the president of the International Federation, C. W. Macara, and the official auditors, from which the following is taken:

To the Editor of the Manchester Guardian:

Sir:—We observe in your issue of today that you have published a copy of a statistical report addressed to the International Federation of Master Cotton Spinners and Manufacturers' Associations by Messrs. David Smith, Garnett & Co., the accountants employed by this International Federation. The report is marked in red: "Strictly private and confidential; not to be given to the press." It is dated Nov. 24, 1905, and was issued so as to reach simultaneously all the individuals, firms and companies who had supplied returns relative to their respective concerns and who were therefore entitled to receive a copy of the report. We desire to state as publicly as possible that the publication of this report is unofficial and unauthorized.

We call attention to this incident, not for the pleasure of saying "I told you so," but that the impossibility of managing the international cotton trade in secret may be emphasized. To expect that a report dealing with such an important subject can be distributed broadcast to two-thirds of the cotton manufacturers of Europe and kept from the public by marking it "Strictly private and confidential; not to be given to the press," either in red or any other color, merely shows an utter lack of appreciation of the vigilance and power of the press.

The report is as follows:

To the International Federation of Master Cotton Spinners' and Manufacturers' Associations:

Gentlemen,—We beg to report that we have received returns respecting the consumption of cotton for the year ending 31st August, 1905, and the stocks of cotton in the hands of spinners at the end of that period, as follows:—

	Year's Consumption Bales.	On Hand Aug. 31.
Great Britain	2,120,730	248,016
Germany	1,499,735	310,094
France	588,616	90,605
Italy	688,997	192,679
Spain	149,833	20,000
Switzerland	101,382	22,931
Portugal	72,229	21,570
Belgium	148,491	29,342
Total	5,370,013	935,237

Returns have not been received from Austria and Russia, owing, we understand, to the disturbed state of affairs in those countries. With regard to the returns generally, it should be stated that they have been asked for only from the members of associations which are federated with the International Association, and not from the whole of the trade. In the case of Great Britain, returns have been received from the owners of 89 per cent. of the spindles in respect of which returns were invited. In the case of each of the other countries, the percentage of returns received, as compared with the total number of spindles running, is: Germany, 92 per cent.; France, 67 per cent.; Italy, 87 per cent.; Spain, 43 per cent.; Switzerland, 98 per cent; Portugal, 100 per cent; Belgium, 93 per cent.

The aggregate of the returns represents 68 per cent. of the total spindles running in the countries specified.

We have prepared from the returns from which the figures given above have been compiled, and from information supplied to us by the officers of the Continental Associations, the following table showing the estimated total spindles, consumption, and stock for each of the countries mentioned:—

Country.	Total spindles.	Estimated consumption 1st Sept., 1904, to 31st Aug., 1905. Bales.	Estimated stocks in hands of spinners, 31st Aug.,'05 Bales.
Gt. Britain	46,000,000	3,600,000	400,000
Germany	8,800,000	1,625,000	336,000
France	6,200,000	990,000	153,000
Italy	2,760,000	770,000	220,000
Spain	1,700,000	351,000	47,000
Switzerland	1,456,546	103,600	23,400
Portugal	334,190	72,229	21,570
Belgium	972,000	159,300	31,580
	68,222,736	7,671,129	1,232,550

It will be easily understood that in making a new departure there have been for the first time difficulties which will not arise again; and as some of the figures have come in only at the last moment, the table of estimated consumption and stocks may not be absolutely accurate. In future it will be possible in a shorter time to state the result of any returns which may be obtained.

Pursuant to the instructions of the Committee of the International Cotton Federation given at the meetings in Paris on the 13th, 14th and 15th inst., this report is being issued by us so as to reach the members of the associations in each country at the same time, and the members of the International Committee are unaware of the contents, and they will receive the report only at the same time as the other members of the associations.—We are, gentlemen, yours obediently,

David Smith, Garnett & Co.

Great reliance has been placed by the International Federation on these statistics as a means of counteracting the cotton speculator in his favorite device of issuing apparently authoritative statistics regarding stocks and consumption of cotton, about which he has no special information. Now that the impossibility of keeping the reports secret

has been demonstrated, it is to be hoped that the energies of the committee will be directed toward inducing the various European governments to undertake the task of compiling the mill stastistics of stocks and consumption, as is now being done by the United States Census Department.

The Philippine Tariff.

A strong effort is being made at Washington to pass a tariff bill by which the duties on Philippine products imported into the United States will be greatly reduced or abolished altogether. Whether such a law should be passed depends first upon whether the injury it may cause to American interests is likely to be greater than the benefits that would result from it. That can be decided only by careful investigation and by giving those whose interests are involved full opportunity to be heard.

It is not likely that the free admission of Philippine products would work any direct injury to the textile industry, but before any more Philippine tariff bills are passed the blunders in former bills of this kind by which the American textile industry has been injured, should be corrected. Last year the war department was on hand, as at present, asking for tariff changes to benefit the Filipinos. The Secretary of the Treasury, accompanied by Col. Edwards, Chief of the Bureau of Insular Affairs, appeared before the House committee to advocate the changes. The report of that hearing contains the following colloquy in which the colonel told the committee how he had fixed the schedules "to fit American looms:"

Colonel Edwards—The cotton-goods people made some comment about the width of the cloths and the schedule was arranged to fit United States looms. Only some minor changes were made in that.

Mr. Boutell—From what cotton mill do most of our cotton goods, going to the Philippines, come from?

Colonel Edwards—Everett, Heany & Co. are very much interested in this; the American Export Association; Claflin & Co. of New York seem to be much interested in it; in other words, they ship out of the port of New York a great many of these goods which are sent through export houses.

Mr. Boutell—What I meant to say was, whether you know from what mills most of our exports went, the southern or the New England mills.

Colonel Edwards—I do not know.

Mr. Needham—Do you know what average rate of duty the old bill provides for?

Colonel Edwards—We figure that it would be about 18 1/4 per cent., but the minimum ad valorem provisos possibly will bring that up to 20 per cent. without any actual increase. It might be called, in broad terms, a 20 per cent. tariff—a little bit less than that I should say—a revenue tariff.

Mr. Needham—This tariff places the United States the same as any other country?

Colonel Edwards—Yes, sir; it places the United States equal with any other country, excepting that we have given the consideration to special interests, by drawing specifications to fit American goods, wherever practicable, straight through.

The bill was passed as drafted by the war department. As soon as it was published it was discovered that the changes "to fit American looms" had raised the duty on practically all the standard American prints about $6.00 a case, and that English cotton goods instead of American fabrics had been favored by the new law. This result did not prove that any official connected with the framing of that bill had deliberately fixed the schedules to favor English cotton manufacturers and injure the American industry. It did prove that those who framed the cotton schedule did not know what effect the changes would have. When Col. Edwards was telling the Committee on Ways and Means that the schedule was arranged "to fit United States looms," neither he nor the Secretary of War, nor any member of the committee present showed any signs of knowing what the changes were. They believed the changes would benefit American manufacturers because some one had told them they would. These alterations had been adopted by the officials of the war department at the suggestion of a New York firm engaged in the cotton goods trade. There is no reason so far as we can learn for questioning the good faith of this firm. It was merely a stupid blunder placed hastily on the statute book by legislators and department officials, who were ignorant of its probable effects, and without properly submitting it to the scrutiny of the cotton trade. The form in which the schedule was placed before the trade made it practically impossible for any one in this country to know, without making long and unfamiliar calculations, what the changes were. Here, for example, is the way paragraph 117 was submitted for examination:

By the number of threads is meant the threads of warp and weft in a square of six millimeters.

Old Law.

(a) up to 18 threads, kilo..... .10
(b) from 19 to 30 threads, kilo..... .14
(c) from 31 to 38 threads, kilo..... .18
(d) 39 threads or more, kilo..... .28

New Law.

(a) up to 18 threads, pound..... .10
(b) from 19 to 25 threads, pound..... .14
(c) from 26 to 38 threads, pound..... .18
(d) 39 threads or more, pound..... .28

This exhibit conveys no idea to the minds of cotton manufacturers or merchants. Only when reduced as follows to American terms does it become intelligible:

By the number of threads is meant all the threads of warp filling in a square inch.

Old Law.

(a) Up to 76 threads, pound..... .04 1/2
(b) From 77 to 127 threads, pound..... .06 1/2
(c) From 128 to 160 threads pound ..... .08
(d) 161 threads or more pound..... .13

Proposed Law.

(a) Up to 76 threads, pound..... .04 1/2
(b) From 77 to 105 threads, pound..... .06 1/2
(c) From 106 to 160 threads, pound..... .08
(d) 161 threads or more, pound..... .13

It requires but slight attention to the last exhibit for the American manufacturer to discover that the duty on goods having from 106 to 127 threads of warp and filling per inch will be increased by the proposed law from 6 1/2 to 8 1/2 cents a pound. From this he would know at once that practically all standard American prints, 64 by 64, 64 by 60 and 56 by 56, having from 112 to 128 threads of warp and filling per inch would be adversely affected, and that the efforts of the war department to "fit American looms" were certain to result in a misfit.

When the old and the proposed Philippine tariff schedules were received by this journal with a request for suggestions we promptly advised the Secretary of War to base the Philippine tariff on American weights and measures. How that suggestion was received by the war department is shown by the following extract from Col. Edwards' testimony before the committee, in which he refers to it as "one little thing:"

Colonel Edwards—In all this correspondence there is nothing at issue at present except one little thing. We had one suggestion that the United States scale of weights and measures should be put in. We have the metric system there, and the old tariff is on the metric system. It is what they are accustomed to. Otherwise, I think, all the criticisms that we have here as a result of our invitation have been reconciled in this tariff. I do not recall anything at issue between any special interests in this country that obtains in the present tariff.

If this "one little thing" had been attended to the one big blunder of raising the Philippine duties on standard American cotton goods would probably have been discovered before the bill became a law. The blunder, however, is now the law of the land. It can be corrected only by act of Congress, and now that the war department is again asking Congress for legislation to help the Filipinos, it seems to be an especially opportune time to insist on justice for Americans.

Wool.

As a result of the prosperity in the domestic wool trade, the imports of wool in the year just closed have been exceeded in only one previous year, 1897, when the imports were abnormally large because of the approach of the date on which the wool duty was to be restored. The effect of prosperity on the domestic wool trade has been to raise prices far above the high level of 1899. It is necessary to go back to the few years following the close of the Civil War to find wool selling in the domestic market at prices equal to those of the present time.

For the eleven months ending November, 1905, the imports of wool amounting to 233,894,038 pounds. The following statement gives the amount of each class for the first eleven months of the last three years:

1903.	1904.	1905.
	Class 1.	
36,868,928 lbs.	53,478,724 lbs.	108,200,389 lbs.
	Class 2.	
12,331,227 lbs.	18,660,237 lbs.	20,154,020 lbs.
	Class 3.	
114,078,237 lbs.	97,173,659 lbs.	105,539,629 lbs.
163,278,392 lbs.	169,312,620 lbs.	233,894,038 lbs.

The increase in the total for 1905 is due to the larger imports of classes 1 and 2, wools of the third class showing a small decrease. This decrease is due in large measure to the rise in the price of wool, which has affected the movement of carpet wools more than the wools of the first and second classes.

The following table shows the imports and exports of raw wool for the last sixteen years and illustrates very clearly the protection to the domestic wool grower from the present tariff:

EXPORTS AND IMPORTS OF RAW WOOL, YARN AND WASTE.

Lbs. in units of one million. Value in units of $'00,000.

Year Ending June 30.	Exports.		Imports.					
	Wool.		Wool.		Shoddy, noils, etc.		Yarn.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs	Value.
1890	.231	.335	106.3	152.6	5.0	20.5	3.5	19.9
1891	.291	.394	129.3	182.4	1.2	4.3	2.0	11.9
1892	.202	.306	148.7	196.9	.3	.9	1.3	7.5
1893	.091	.148	172.4	210.6	.3	1.1	1.2	6.9
1894	.520	.906	55.2	61.1	.1	.5	.5	3.6
1895	4.289	4.844	192.8	229.9	14.1	19.8	2.4	11.7
1896	6.945	8.559	228.4	315.0	18.7	26.5	2.0	10.5
1897	5.271	6.199	366.6	567.5	49.9	69.3	1.8	9.6
1898	.121	.180	132.8	167.8	3.3	6.9	.3	1.9
1899	1.683	2.373	76.7	83.2	.3	.7	.2	1.1
1900	2.200	3.872	155.9	202.6	.4	.9	.2	1.3
1901	.200	.240	104.0	125.2	.6	1.8	.2	1.5
1902	.128	.183	166.2	177.1	.2	.8	.4	1.9
1903	.518	.718	177.1	221.5	.3	.9	.3	1.9
1904	.319	.371	173.7	248.1	.2	.5	.1	1.1
1905	.123	.150	249.1	462.2	.2	.8	.1	1.2

In the domestic market an important feature has been the tendency to make contracts for wool long in advance of the shearing. This practice corresponds in a measure to the future contracts in the cotton market, the principal difference being due to the absence of dealings in wool on a public exchange. If facilities for buying and selling wool futures on "change" were available we would doubtless see a wilder and more injurious manipulation of the wool market than now takes place in cotton. That the wool trade is spared this disaster is due to the fact that transactions are now confined to definite lots and grades of wool and to definite buyers.

Clothing wool during the last year has supplied the only sluggish feature of the wool trade. This has been due to the trend of fashion toward worsted effects. With a continuance of the present prosperity of the country the demand for clothing wools will doubtless increase. This result may be hastened by a change in fashion, and seems inevitable in face of the scarcity and high price of worsted wool.

The new year begins with wool growers and manufacturers enjoying prosperity and facing bright prospects for the future.

The Wool Duty in Canada.

Incidentally, the hearings before the Canadian Tariff Commission are disclosing the advantages resulting to the wool growers of the United States from the operation of the Dingley duties on wool. Under the present Canadian tariff a duty of three cents per pound is imposed on coarse lustre wools, such as are grown in Canada under the following section:

390 Wool, viz.: Leicester, Cotswold, Lincolnshire, South Down combing wools, or wools known as lustre wools and other like combing wools, such as are grown in Canada, three cents per pound.

With this exception, wool is admitted into Canada free of duty, and, as will appear from the extracts from testimony before the commissioners, even this section providing for a duty on lustre wools is evaded. Moreover, the Canadian law admits partly and wholly manufactured woolen goods at low ad valorem rates, which are easily evaded and in fact offer a premium on undervaluations. Under the Dingley law, on the other hand, the duty on wool ranges from 4 to 12 cents per pound, only the cheapest carpet wools being admitted at the low rate.

It is not the duties on wool alone that afford protection to the wool grower. The rates on partly or wholly manufactured woolen goods must be equally effective in order to protect the wool growing industry. In this respect the Dingley law leaves little to be

desired, imposing as it does specific and ad valorem rates varying from 60 to 160 per cent. on wool manufactures, as compared with the 35 per cent. ad valorem duty in Canada.

The difference in the protective character of the Canadian and Dingley schedules is well illustrated by the respective rates on worsted top. Under section 391 of the Canadian law worsted tops made from the lustre wools named in section 390 are subject to an ad valorem duty of only 15 per cent., all other grades being admitted free, while under the Dingley law worsted top is subject to the highest rates imposed on manufacturers of wool, the duty being prohibitory. The Dingley law is, moreover, supplemented by a stringent administrative act which makes evasions and violations extremely difficult and dangerous.

The result of this difference between the tariff laws of Canada and the United States was stated before the Canadian Tariff Commission at Calgary, Alberta, last month, and reported as follows in the daily press:

In the wool industry there was an extended discussion. The sheep and wool industry in the two new provinces was declared to be on the decline, and with certain ruin before it. This is true, even when the price of wool is higher throughout the world than at any previous time. In Canada, fifteen cents per pound is the top price, but right across the line in Montana the same wool commands twenty-six cents. This is an item that Mr. Fielding's attention is to be called to in a very emphatic manner.

Secretary Peterson of the Board of Trade says the duty on wool coming into Canada is three cents per pound on that of the same class produced here, but on other wools there is no duty. The complaint today will be that even the wool that should pay a duty under the classification is admitted free, because the law is not enforced. The factors in the western industry want a duty of five cents placed on wool which comes into competition with Canadian wool, and they want the classifications revised. This has not been done since 1879.

The woolen manufacturing industry in Canada has been practically wiped out by low ad valorem duties and British preferential rates. In applying the protective remedy the Canadian lawmakers will find it necessary to protect every branch of the textile industry, as the evidence at Calgary conclusively proves.

Seasonable Fabrics.

MEN'S WEAR WOOLENS.

The year which has just drawn to a close has proved to be the most generally successful one in the history of the manufacture of men's wear woolens in this country.

Prices on all lines have been and are materially higher, on account of the advance in the price of raw material and also of labor, but the demand is such that it is an impossibility to keep pace with the requirements.

The light weight season has prolonged its usual duration, and there is no rush as in former years to open lines of heavy weights. The bulk of the 3/4 wool goods and most of the 6/4 wool fabrics shown have been deteriorated in quality in order that they might be sold under the same tickets as last year, and at the same quotation. This is misleading to buyers and apparently unnecessary as the agents do not claim that the quality of the fabric is the same. Notwithstanding the objections made, a number of orders of considerable dimensions have been placed for meltons, friezes, kerseys and thibets and it is noteworthy that black has predominated in all the fabrics booked.

Kerseys are attracting a great deal of attention and are open in spots at prices ranging from $1.00 to $2.25. Those shown at the lower figure consist of very inferior stock and are similar in quality to what has usually been shown around 75 cents.

A number of new lines in kerseys are shown from $1.25 to $1.75.

Thibets, cheviots, cassimeres, serges and staple piece dyes in medium grades command an advance of 10 per cent. to 12 per cent. advance above last years quotations. There are an unusually large number of manipulated fabrics shown at prices that compare favorably with those of last year. Lines are shown at $1.27 1/2 to $1.35 that were sold a year ago at $1.22 1/2; and at $1.05 to $2.25 that sold last year at $1.50 to $1.95.

The woolen end of the trade is keeping

prices down and making an aggressive bid for business, with the result that marked increase is expected over what was secured last year.

The American Woolen Company has opened its lines of overcoating in department 1, division B, and the way in which buyers have taken hold of the 1906 heavy weights indicates a healthy condition of the market. From the fact that new ranges have been brought out and other fabrics different in construction from last year, no direct comparison can be made of the lines as a whole. On some fabrics the advance is 10 cents and others, when compared with last year, are higher by 15 to 17 1/2 cents. If a profit is to be made on certain of the high class fabrics, which are not directly comparable with lines of last year, the prices reported are probably an advance.

Some numbers are, however, a trifle lower. These irregularities in the valuations, while they appear incongruous to certain leaders in the trade, are nevertheless a result of the wide variety of products and diversity of the mills in the American Woolen Company's organization. The advance made on friezes is shown to be less than that on meltons and kerseys. New ranges have been bought out in piece dye, all-wool ranges, at about $1. In the cotton carded thibets, the open ranges are from 80 to 85 cents, as compared with 72 1/2 to 80 cents on frieze fabrics, the prices range from 82 1/2 cents to $1.05, showing advances in some instances and in others old values. In "lofty handle" overcoatings prices range from 97 1/2 cents to $1.50.

In department 3 of the same company lines from the Ray mill are shown from 77 1/2 to 80 cents; Andersons at 85 cents; Vassalboro, 80 to 90 cents; Chase mill, 90, 95 cents and $1.00.

W. W. Capers, Jr., is showing a line of Belgrave suitings, 18-ounce, at 75 cents, also Dover mercerized worsted at 55 cents.

Wendel, Fay & Company opened Campbell kerseys at $2.25, and Moule, 31-ounce, soft overcoatings at $2.12 1/2.

Hyde & Jacka have opened lines of Berwick mills wool overcoatings in blacks at $1.10, and Oxfords mixed at $1.15.

A. L. Levy has opened lines of overcoatings for the fall, including Verona coatings, at 90 cents. He also shows Devonshire worsteds, Ogden, Berkley and Jefferson fabrics. J. N. Peet opened lines of 16-ounce all wool thibets, 95 cents and $1.10. He has also shown 3/4 and 6/4 thibets up to 80 cents. Converse, Stanton & Company, in the Brouard & Wilkinson department, are offering Chapel thibets and overcoatings at last year's prices. Thomas Ould is showing a line of 18-ounce mercerized worsteds at $1.12 1/2 net. R. K. Mulford is showing chinchillas for fall wear at $1.15 to $1.45.

Ethan Allen opened a line of fancy cassimeres for fall at $1.00 and Snedeker & Orchard frieze overcoatings at 95 cents. The Earnscliffe Worsted Mills have sold up their Saxonville mixtures. The Caledonia Mills opened lines of 3/4 fancy suitings at 22 1/2 cents net, 25 cents net and 29 cents net. The Rariton Woolen Mills' lines of fall overcoatings, including the Raritan and Somerset ranges, have been opened; most numbers are at last year's level. The Aetna Mills have shown a double yarn serge for fall, 16-ounce, at $1.50; 18-ounce, $1.67 1/2, also a 16-ounce wale serge at $1.75, an 18-ounce serge at $2.00, and unfinished worsteds at $1.75.

The Plainfield Woolen Company made an advance of five cents on all piece-dye worsteds and serges. Holmes & Long have opened Victor overcoatings in mixtures at $1.07 1/2; Waldorf suitings at 70 cents, and Glenloch suitings at 72 1/2 cents, also lines including Lanark fancy overcoatings at 80 cents, and additional lines in their new Vendome worsteds at 87 1/2 cents. J. K. & L. S. Weiner have sold up and withdrawn the Rock River worsteds for the spring of 1906. D. S. Mackey & Sons, Inc., selling agents for the Intervale Mills, opened fancy suitings from 23 1/2 to 27 cents, also an additional line of Tiltons at 70 cents.

John M. Harris & Company opened lines of mercerized worsteds ranging in prices from 95 cents to $1.35; also wool fancy cassimeres at 95 cents and $1.05, respectively, lines of 3/4 and 6/4 worsteds, ranging from 25 cents to $1.00, also fancy overcoatings from 30 cents to $1.05. The Oakdale Mills Company are showing meltons and kerseys for the fall of 1906, at prices ranging from

$1.05 to $2.12 1/2 for kerseys and from $1.12 1/2 to $1.67 1/2 for meltons, and are offering wool suitings at prices from 60 cents to $1.25.

Greeley, Cushman & Record have shown the Oaklands at 77 1/2 cents as compared with 75 cents last year. The Pittsfields opened at 75 cents and 82 1/2 cents, and lines of Waverly suitings, ranging from 75 cents up. H. & W. H. Lewis are showing 28 and 30-ounce kerseys at $1.20, $1.25 and $1.35. William Wood & Company have sold up and withdrawn the 3/4 Ambler cassimeres for the spring of 1906. They are showing in range, 5,400, the 6/4 fancy worsteds at $1.25, also fancy worsteds at 95 cents, and 3/4 meltons at $1.50, and an additional line of fancy worsteds at 46 1/2 cents, also 3/4 fancy Glamorgans at 45 cents. Whittemore & Frieze have opened their Monarch, Seaconnet and Ancona 3/4 and 6/4 suitings, also two lines of 3/4 worsteds, one at 25 cents and the other at 35 cents. W. J. Dickey & Sons, Inc., have opened a line of Laurel cassimeres, 20-ounce, at 67 1/2 cents. Donalds, for the fall of 1906, 20-ounce at $1.07 1/2; lines of staple meltons and smooth-faced overcoatings from 24 to 28 ounces and ranging in price from 97 1/2 cents to $1.32 1/2; and two fancy overcoatings, one 24-ounce at 72 1/2 cents, the other 26 ounces at 87 1/2 cents.

Mackintosh, Taft & McKenny have opened overcoatings and staple suitings for the fall of 1906 in all their lines. A large number of entirely new fabrics are included in the offerings. The goods are shown as follows: Stanley Woolen Company's overcoatings, 22-ounce A. W. meltons, $1.32 1/2; 28-ounce A. W. meltons, $1.62 1/2; H. F. Murdock & Company's overcoatings, 32-ounce C. W. frieze, 90 cents; H hairline, 75 cents; N thibets, 75 cents; M thibets 90 cents; Charles River Woolen Company's overcoatings and staple suitings, R and S thibets, 11 1/2-ounce, 21 cents; R and S printed thibets, 25 cents; 44 black, 16-ounce meltons, 35 cents; 16-ounce fancy meltons, 40 cents; C. W. R. Co. overcoatings, 35 cents; C. W. R. Co. fancy overcoatings, 36 1/2 cents; W. E. Hayward & Company's overcoatings and staple suitings, 6 1/2-ounce suitings, 27 1/2 cents; 6 1/2-ounce thibets, 27 1/2 cents; 10 1/2-ounce suitings, 30 cents; 10 1/2-ounce thibets, 30 cents; 12 1/2-ounce thibet overcoatings, 32 cents; fancy thibet overcoatings, 33 1/2 cents; Douglas overcoatings, 35 cents; H. T. Hayward overcoatings, 32 1/2 cents; wool overcoatings, 35 cents; fancy overcoatings, 37 1/2 cents; mohair overcoatings, 40 cents; Schusher Woolen Company's overcoatings and staple suitings, two 6 1/2-ounce thibets, 27 1/2 cents; 6 1/2-ounce suitings, 27 1/2 cents; 10 1/2-ounce suitings, 30 cents; 10 1/2-ounce thibets, 30 cents; 12 1/2-ounce thibet overcoatings, 32 1/2 cents; fancy thibet overcoating, 34 cents; Schusher overcoatings, 35 cents; Taft Woolen Company's overcoatings and staple suitings, 10 1/2-ounce Caryville meltons, 25 cents; 14-ounce Caryville meltons, 27 1/2 cents; 15 1/2-ounce Caryville meltons, 30 cents.

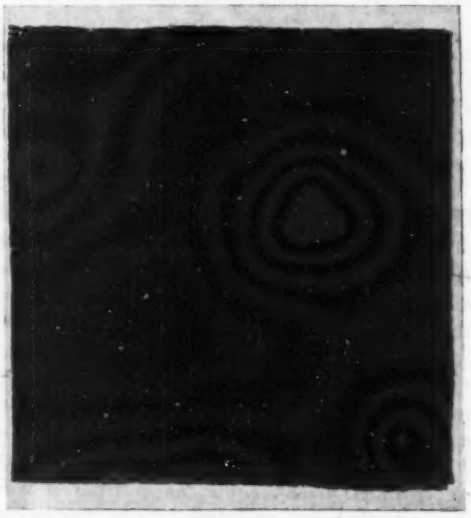


FIG. 1.

DRESS GOODS.

There is no great activity in evidence, and interest is principally centered in the duplicates that the cutters are sending in; but manufacturers are almost unanimous in stating that their spring business has assumed more than normal proportions.

The call for broadcloth has been of such dimensions that deliveries can not be made from three to four weeks from the time the order is placed. This is more particularly

true of the new red and purple shades. The most popular fabrics are broadcloth, as already mentioned, henriettas, prunellas and French serges. Grey panamas in plain and overchecks have sold remarkably for spring delivery, while china blues and tans are taken in the plain colors.

Large orders have been placed for chiffon voille, batistes, albatross and allied weaves. Cream worsted fancies and cream serges promise to be more prominent than ever. Fig. 1 shows a hairline overcheck made by the Empire Worsted Mills, 36 inches wide at 35 cents regular. The request for this class of goods is continuous for retail at 50 cents.

SILKS.

The outlook for increased business is materially improved and manufacturers are much more optimistic than they were a month ago. The demand for spring, though not up to expectations, or the capacity of the mills, is regarded as moderately satisfactory; this is particularly true in spots. The aggregate volume of silk textiles reached the enormous sum of one hundred and five millions of dollars, during the year just past, and prediction is made by no less an authority than Daniel S. Mercein, that this will witness an increase of 50 per cent., yet the selling agent who reports business as satisfactory is an exception.

In silks for the coming spring the change from plain colors to figured and floral designs will be marked in all the different weaves, but the small designs and broche effects will most prevail.

COTTON WASH GOODS.

The jobbers are now opening their spring lines and every indication points to a very large demand. Substantial orders have been booked by men on the road, on all lines of cotton dress fabrics, and the request for higher grade goods is noticeable. Silk and cotton fabrics with a jacquard figure in all the new shades at prices around 30 cents, have been very successful.

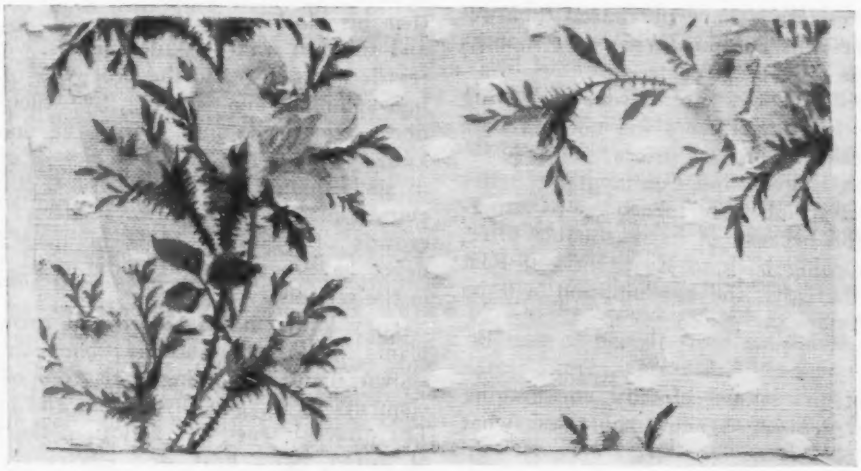


FIG. 2.

An advance has taken place in standard percales and a number of tickets in dress ginghams; with the upward tendency on all lines marked. Prints have also shared in the advance and stocks on hand are firmly held at the new quotations. A scarcity is predicted on certain lines of white goods, such as India linens and Persian lawns, with an advance of 10 to 15 per cent.

Dotted swisses have been taken very freely, and some very attractive designs are shown by the importers and the domestic manufacturers. Fig. 2 shows an Alsace print brought out by Ed. Kampmann, 32 inches wide, at 57 1/2 cents.

FIFTEEN-CENT COTTON.

(By a prominent English cotton manufacturer.)

Manchester, Dec. 20, 1905.

The trade cannot pay 15 cents: 1. The heavy buying of this spring in cloths for the Far East at a basis of 8 to 9 cents has filled that market, and today Manchester merchants are reselling their purchases to other markets, because of the heavy stocks of cloth now held in the Far East.

2. The home trade distributers of the different countries have purchased their requirements this autumn for 6 to 12 months on a basis of 10 to 11 cents.

3. Order books are already showing signs of repletion, buyers will not purchase any quantity at present prices.

4. The English and Continental spindles which last spring were turned on to American cotton because of its reasonable price, are all turning back to Egyptian and East Indian, therefore the consumption will be less of American.

NEW FIELDS.

Present prices are already encouraging extensive growing in new countries: what will 15 cents do?

PRESIDENT JORDAN'S POLICY.

President Jordan is stated to have proclaimed that "what we are working for in the end is to bring about a condition of affairs so that the mills can buy directly from the producers at a price to be agreed upon and that will be mutually satisfactory. Will 10 cents at the beginning of a season and 15 cents in January help the movement?

THE RESULT.

Should 15 cents be adopted, it will probably result in a united short time movement among manufacturers.

THE GOLDEN EGGS.

Remember the old adage, "Don't kill the goose that lays the golden eggs." The Southern Cotton Association have succeeded in raising the price from 7 1/2 cents last January to 12 1/2 cents today. Is it not time "to rest and be thankful?"

TEXTILE INDUSTRIES AND THE SCHOOLS.

BY FRANK O. CARPENTER, English High School, Boston.

The ordinary man knows nothing about the textile industry of the United States, although it is one of the three most important industries of the country. He knows, in a general way, how wheat and corn are grown, and beef cattle are raised for the market. He has some idea of the production and manufacture of iron and steel. He understands that his clothing is made of cotton, wool, and silk, but what "textile" means, what the textile fibres are, and the processes of carding, spinning, and weaving, by which these fibres are turned into fabrics, he does not know. This is not from any lack of interest in such things, for exhibits of textile machines in operation always attract large crowds of visitors. It is because people never have been taught about these things in the schools.

They know the structure and growth of plants, from their botany; chemistry has shown them that things are composed of elements as oxygen, hydrogen, and carbon. They have learned the action of the forces of sound, light, heat, and electricity, from the science of physics, but of the larger science of commerce, i. e., commercial products and human industries, they know and can tell nothing, though they meet these facts of human life daily. They are like blind men walking among great piles of merchandise which they need and do not see. This condition ought not to exist, and it is the purpose of this article to show that the schools are waking up to the need of practical instruction in common things, and to tell a few of the ways in which textile industries are taught and benefited.

Children are now taught in the kindergartens and primary schools to weave or plait strips of colored paper and worsteds in varied patterns or "weaves." They are told stories of the cotton and how it is picked, and are shown the cotton boll. They are told of the sheep and how the wool is sheared from the animal. In many of the best grammar schools the pupils are shown

the textile fibres, the word "textile" explained, and the principal processes of manufacture described and photographs shown of mills and workmen. In some schools a hand loom is used and the pupils can weave for themselves a bit of cloth and know the process of weaving from sight.

In the high schools this subject is yet new, but 20,000 pupils in the United States during this past year studied the science of commerce, or commercial geography as it was first called. Each of these pupils was taught something of the textile fibres from raw material to finished product, the sources of raw materials and the world markets for the surplus goods. They know what "warp and filling" means, what mercerized cotton is, and the uses and misuses of "shoddy" in cloth.

The value of the textile schools at Philadelphia, Lowell, New Bedford and elsewhere, needs no argument before the readers of this magazine. The many new textile mills built each year must have trained men as superintendents. The days when men can climb from the loom and spinning frame to the "supers" office are almost gone by. The textile schools must supply the trained men, and their students must come from the high school graduates, for the workers in the mills, however intelligent, have rarely the time, the money, or the ambition to take the textile school courses. Therefore the high schools must be "feeders" for the textile schools and fit pupils for them as they do now for the colleges and scientific institutions. When this is done, and the American youth has a fair chance to learn the trade, it will no longer be necessary or possible for Germans to fill so many of the important positions in the textile mills. The German gets his skill from the many well-equipped technical schools in his own land.

The study of commercial geography in the English High School, in Boston, under the writer's direction, is only a few years old, but already one of the graduates is at the Lowell Textile School, taking high rank in his work. He was induced to go by his study of textiles in the high school.

Though the start has been made on these lines, much remains to be done. In many ways the study of the industries of daily life can be brought into the schools where it is not done now. For example: In the study of arithmetic, which every pupil must have, the problems could more often be made practical. After the principles of any operation, as, addition, division, etc., have been explained and fairly well learned, the further repetition of countless, abstract examples is a monotonous and wearisome task. All the practice which is necessary should be given by practical questions based on some of the chief industries of life, taken from real business, and not the imaginary examples devised by teachers in their own libraries. If the pupil did not do so many examples at each lesson by this method, he would learn the principle taught more clearly, because the real example would excite his interest, and he would remember better and be more valuable and "quick at figures" later, in actual business life.

For example, if a pupil was to multiply 40 by 840 he would get, of course, a certain amount of benefit from multiplying the abstract figures. He would get far more benefit, however, from an example like this:

"A hank of cotton yarn contains 840 yards. A yarn of a certain size and weight has 40 hanks to the pound. How many yards of yarn in a pound?" In the same way, the number of trees in an orchard, bushels of wheat in an elevator, tons of coal mined weekly, etc., give ample material for all kinds of examples. The study of percentage, discount, negotiable paper, insurance, should be applied in the same way. The writer does not deny that this is done to a considerable extent now, but the point he wishes to make emphatic is this: The study of arithmetic, geography, science, should not be taught as separate subjects, illustrated by the facts of daily life, but the pupil should be taught that his education is to make him better fitted to live his life among men, and that the arithmetic, geography, etc., have no use whatever except as they can help him to do more easily and perfectly the work he has to do in the world. That is, these studies are means, not ends. When this point is made clear, a pupil never

asks again, "What is the use of studying arithmetic, etc.," and he is more willing to study.

So too, in the near future, it will be thought necessary to teach all children the facts of commercial science, about foods, textiles, buildings, etc. When this is done, people will feel themselves inexcusably ignorant, if they do not have a fairly clear idea of cotton, wool, flax, hemp, jute, silk, mohair, and the way they are made into cloth and fabrics. The benefit of this knowledge will help the textile manufacturer as much as it does the community for several reasons.

First, because the public, knowing more about the quality of goods than now, will recognize a good article and buy it, and pay a fair price for it, thus giving the manufacturer a reasonable profit. They will refuse to buy poor goods at any price, and so help the honest maker.

Second, the citizens and voters knowing something of the conditions under which the textile manufacturers produce their goods, will assist them by their votes, in state and nation, to obtain better local conditions, lower taxes, etc., and support them in their efforts to secure tariff rates from Congress which shall be decent, sensible and just.

Third, the greater knowledge of industrial conditions will make the people demand higher wages and better standards of living in all grades of society, which will mean larger purchases of the necessaries of life, among which the products of the textile mills form the principal part.

For these reasons all textile manufacturers and dealers should assist this movement for practical education in the schools, by every means in their power, and these are many,—sympathy, argument, money, votes, public support.

Each textile manufacturer should see to it that the high school in his town has a complete set of specimens of the materials used, and the goods made by him, showing the different steps or processes used in the making.

Such a set would be of use for many years in actual instruction in different ways. It would also be a source of great local pride to the teachers, the pupils and the townspeople, which would be often shown to visitors, and as a personal and business advertisement would be of value. It would return to the giver, in the long run, more of honor, grateful appreciation, and often actual money profit, than the labor and cost of the gift would warrant or deserve.

If any manufacturer doubts the correctness of this statement, based on the writer's own experience, he is urged to try the experiment, and in the words of the old proverb, "Go and see!"

THE MANUFACTURE OF A CHEAP WOOLEN CASSIMERE.

BY A. SCOTT.

In view of the high price for wool and the ever-present demand for cheap woolen fabrics the resources of the manufacturer must necessarily be taxed to the limit to produce something that will "fill the bill" and at the same time show a profit, or even a new dollar for an old one. For certain grades cotton warps of course are brought into play, but these have their drawbacks and limitations. In the first place there is the difficulty of obtaining the diversity of coloring required in warp patterns of fancy cassimeres, then there is the cottony handle, which is inseparable to the use of these warps, and added to these is the fact that most manufacturers prefer to make their own warp yarns and so keep the carding and spinning departments running full time.

On the other hand there is always a steady demand for a good woolly handling fabric with life and snap. Let us suppose we have an inquiry for a fabric of this character in heavy weight, about 19 1/2 ounces, say, at 75 cents per yard, with a promise of good orders if we can turn it out satisfactorily. We can figure out a batch something like this:

15% coarse wool, clean, at 50c.	$.0750
25% cotton, dyed, at 13c.	.0325
60% coarse shoddy, dyed, at 15c.	.09
Cost per pound	$.1975

This stock will spin to 1 7/8 run and make a good firm yarn.

In making mixtures with so small a per-

centage of wool, it is needless to say that one must make the most of the wool. It can be dyed in two colors, say 10 per cent. bright orange and 5 per cent. scarlet. This, with black cotton and shoddy, makes quite a desirable fancy mixture. The proportions can be varied indefinitely till a good selection is obtained.

For light mixtures the wool as well as the cotton can be used white; thus 40 per cent. of the whole batch will be white, which will make about as light a mixture as will be likely to be required in winter goods. If more light colored yarn should be required, a few cotton threads can be used to good advantage for embellishment. Various shades of grays and oxfords can be obtained with the use of 5 per cent. or more of white wool and the remainder of black. It is surprising what can be done with but 15 per cent. of wool dyed in such bright colors as green, orange, blue and scarlet, if these shades are harmoniously blended and judiciously used with black or brown for a background.

Considerable judgment must be used in blending the fibres in the batch. For example, if the wool used is coarse, as it probably will be at the price quoted, the quality of the shoddy should be as near as possible to that of the wool in order to produce even yarn.

The lay-out in the loom may be as follows:

1920 ends 1 7/8 run yarn + listing threads;
Reed 10 × 3, 66 inches wide in loom;
34 picks 1 7/8 run yarn.

The loom weight is calculated as follows:

Warp = 1920 ends + 5% (take up) = 2016.
2016 ÷ 187 1/2 (yds. per oz.) = 10.7 ozs. of warp per yd.
Filling = 66 (width in loom) × 34 (picks per inch) = 2244 + 5% (take up) = 2356.
2356 ÷ 187 1/2 (yds. per oz.) = 12.5 (ozs. of filling per yd.)
10.7 (weight of warp) + 12.5 (weight of filling) = 23.2 ozs. loom weight per yd.

If the goods shrink 20 per cent. in finishing this would leave 18.6 ounces, or nearly one ounce per yard, to be made up in fulling in order to obtain the desired weight, that is, 19 1/2 ounces. The chances are, however, that the goods will lose 25 per cent. owing to the large percentage of shoddy; if so, a little extra loom weight will help out in order to avoid over fulling.

The cost is estimated as follows:

23.2 (ozs. in loom)÷.90 (100%—10% loss to yarn)	= 25.8 ozs. stock per woven yard
25.8(ozs.)÷.95(100%—5% shrink)	= 27.1 ozs. stock per finished yard
27.1 ozs. stock @ 19¾c. per lb.	= $.334 cost of stock per yard
Cost of manufacturing	.23 per yard
Mill cost per yard	$.564
Selling price, 75c less 15%	.638
Profit per yard	$.074

We have put the cost of production at 23 cents per yard. This is obtained, of course, by taking the pay roll plus the fixed charges of running the mill for a given period, and dividing same by the production, either in yards or pounds as desired. Each manufacturer has his own ideas of the best method of estimating the cost of fabrics. The method given here is only one of many, but has the virtue of simplicity. The margin of profit shown is small, as is usual in cheap goods, but it may be increased by cheapening the batch, diminishing the weight, or best of all, by increasing the production and so reducing the cost per yard.

If the fabric quoted is carefully handled in finishing, especially in fulling and pressing, it will be a sightly and good handling piece, and, despite the scarcity of wool in its makeup, will stand the commission house test for strength.

In order to bring these goods out bright and attractive a good deal of attention can be given to the fulling and washing. There is an old proverb that speaks of swallowing a cow and choking on her tail. How often the care and time spent in getting up a fabric are lost in the finishing room. A good neutral soap should be used in fulling, and the pieces kept well soaped while they are running in the mill. If the liquor is allowed to get thin and watery, the goods will have a tendency to heat and chafe, resulting in a cheap, played out appearance, which nothing can alter afterward.

If the pieces are well impregnated with soap when taken from the mill and a small quantity of mild alkali, in connection with a good flow of warm water, is applied when scouring, the washer ought to fill up with frothy soap suds without any more soap being added. Extra soap put into the washer

under such conditions is worse than wasted; it is harmful and calls for excessive alkali in order to counteract its effects.

If the fabric is handled along the lines laid down here it will be bright and desirable and will not look cottony, but will be strong and not show too large a plug of cotton when boiled out with caustic.

WOOL BUYING.

BY EDWARD ARNOLD.

If a woolen or worsted mill is to be successful three distinct features must be considered: the buying, the manufacturing, the selling. If these departments are well managed by practical men there is no reason why one mill should be far in advance of another.

Buying the wool is a very important part of the business and if it is not skilfully done the manufacturer will suffer a heavy loss. The manufacturer first decides on the kind of wool he wants for the goods to be made. In most cases he selects from a hand sample the grade required, or informs the buyer as to the grade, which may be one-quarter, three-eighths, one-half blood or delaine. At the same time he notes the market price on wool of the grade wanted, to see if he gets his wool at the same clean price as his competitor. If so, it is up to him to make his yarn so as to show a profit in his yarn department, as all yarn manufacturers figure on a profit. The manufacturer that makes his own yarn should do the same or know why he can't make yarn as cheaply as he can buy it.

In many mills the president or treasurer wants the distinction of being the wool buyer, but first of all the wool buyer should be a man that knows wool and is handling it daily. A president or treasurer, who might see a fleece of wool once a week or once a month, is not qualified for the position of wool buyer, for he has not the knowledge or the sensitive touch. On the other hand, if the president and treasurer are broad-minded men and keep in touch with the trade, they will be of service in telling when to buy, if they have a first class man at the mill to make their selections and go in the market and throw the wool or see it thrown.

In looking for combing wools the first thing to determine is the grade; second, the staple; third, the percentage of combing; fourth, the shrinkage of fleece; fifth, the price. If the buyer is an experienced man he will know as soon as the price is named whether it should be bought or not. If his judgment tells him it is a bargain he will take it and throw it himself or see it thrown. If he throws the wool himself he will have an idea what percentage he is rejecting and should send to the mill his report as to what the wool will cost clean. The manufacturer, having this information, gives the lot a number, and passes the invoice to the overseer of the wool department with instructions to see the wool when it comes in.

When the wool is received it should be weighed and checked up to see if it corresponds with the invoice. Any errors should be reported. Someone may ask why we mention the weighing and checking, as every mill does this. Not so. Not long ago I had occasion to visit a mill using two and a half to three million pounds of wool every year and not one bag was weighed at the mill. The bags in each lot were counted when taken from the car and that was all. I asked the overseer about the weighing and he told me they had no scales for weighing the wool when it was received and had never done so. This condition existed in spite of the fact that a new wool storeroom had recently been built.

When the sample bags are received they are weighed and checked; then the overseer has the bags opened and handles each fleece, weighing the empty bags to determine how many pounds are available for the sorting test. The manufacturer should take a look at the wool and form his opinion, also asking the overseer's opinion. The actual figures from the sorting and shrinkage test are next obtained.

If the wool is bone dry from the dryer it should lie in the open before weighing to regain the natural amount of moisture. It is a good plan to let it lie out over night. An experienced man can estimate closely what percentage certain wools will regain. When the manufacturer gets the sorting test and shrinkage he can tell whether he is pay-

ing more than the market price. If a lot of wool is bought on the basis of the sample bags it is the overseer's business to see that the lot is up to the sample. As he has his tests before him he can tell whether he is getting the percentage of sorts required and judge very closely on the shrinkage.

Which are the most prosperous woolen mills today? Those that have a practical wool buyer. I will give two examples of wool buying that recently came to my notice. A lot of 300,000 pounds was bought by the treasurer and manager of a prominent mill. The lot was bought for staple territory and called a bargain before it was received at the mill.

TEST ON FIVE BAGS, 1122 LBS., @ 19½c=$218.79.

Sorting.	Grease.	Clean.		
Combing ½ blood grade	470 lbs.=41.8% combing.	Shrinkage 75.9%=113¼ lbs.		
Fine medium clothing	402	76.22 = 95½	@ 62c=	$59.21
Medium clothing	234	72.82 = 63½	@ 60c=	38.10
Stained and burry	6	62.5 = 2¼	@ 50c=	1.12
Fribs	2	274½ lbs.		$98.43
Strings	6	Average shrinkage, 75.53%		
Loss	2			
	1122 lbs.			

$218.79 price paid for five bags
98.43 value of clothing sorts

$120.36 cost of combing wool = $1.06¼ per lb.

The worsted yarn could have been bought for 95 cents per pound.

There was a kick on the price and a discount of 2 1/2 cents per pound was obtained. On the 300,000 pounds this discount amounted to $7,500. Even at 17 cents it was an expensive lot.

Another lot of 100,000 pounds was bought from the same dealer by a practical wool buyer who threw the wool himself.

TEST ON FIVE BAGS, 990 LBS., @ 24c=$237.60.

Sorting.	Grease.	Clean.		
Combing ½ blood grade	836 lbs.=84.4% combing.	Shrinkage 63.24%=307¼ lbs.		
Medium clothing	144	66.62 = 48	@ 60c=	$28.80
Fribs	1½	355¼ lbs.		$28.80
Strings	5½	Average shrinkage 64.12%		
Loss	3			
	990 lbs.			

$237.60 price paid for five bags
28.80 value of clothing sorts

$208.80 cost of combing wool = 68 cents per lb.

A comparison of the two purchases shows plainly that careful purchasing of the raw material is essential to the success of a woolen or worsted mill.

	Grease price.	Percent combing.	Shrinkage.	Clean price combing.
No. 1	19½c	41.89	75.9	$1.06¼
No. 2	24c	84.4	63.24	.68

One man depended on brokers while the other depended on his experience. A good wool buyer is a valuable man.

ENGLISH NOTES.

(By our Special Correspondent.)

Great hopes are encouraged of a real revival in British business during 1906. Distinct signs of improvement are observed in the mills and the condition of the industries of the country is warrant for a belief in better things to come. The one discouraging sign is the prevalence of unemployment among unskilled laborers, but this is not incompatible with the welfare of those who are working. Every year the adoption of machinery and the constant fret and change of unprotected industry disgorges a new set of men upon the streets with their trades gone and no openings offering. Except in the dyeing branch, the textile trades are not con-

spicuously causative of these results and the unemployed affect textiles only negatively, inasmuch as they are not, and might be, buyers of goods for consumption. The purchases of the middle classes have been appreciably better during 1905 and they should be better again in the year that now opens.

Among the "Permanent Black" cotton linings which now find their way in large quantities from Bradford to New York none perhaps is more successful than "Marquise" finish by Geo. Armitage & Sons, Ltd. Although names for the process of permanent finishing are numerous, it seems clear that similar methods are applied by all producers. In the first place the cloth is mercerized, then dyed aniline-black, schreinered and tentered, then steamed and pressed, steamed and pressed again, or if need be, three times. By schreinering is meant the fine embossing with myriads of lines which the cloths receive from a pair of rolls. The lower is of engraved metal and the upper of press-paper cards presented end-on to the cloths. The fine lines thus impressed on the goods break up the surface, so that light is reflected at several angles and the plain cotton assumes some of the sheen of silk. Schreinering is by no means the least valuable monopoly of the Bradford Dyers' Association, a $20,000,000 combine, which is making matters difficult for small competitors and is affording a good deal of food for reflection to its customers.

As dischargers of silk and silk waste are probably aware, their effluent of soapy water and silk gum all but defies attempts at precipitation. This fact has been a source of trouble between English silk spinners and dressers and the municipal authorities guarding the sewers. Research shows that the particles of animal gum require some other solid in suspension in the precipitating tank. They agglomerate around the foreign matter and sink, leaving a clear effluent quickly. Indeed the gum helps such particles as occur in domestic sewage to fall more rapidly than they do when unassisted. In this sense, silk-washings are a gain to the purifiers of sewage. Possibly those who seek to regain the grease from suds off silk may find a hint of how to proceed from these indications.

Some remarks on the recovery of grease from wool-washing liquors have brought inquiries how to bleach and deodorize the oil which is squeezed in hot presses from the "magma" or fat-cake created by the addition of sulphuric acid to liquors in the settling tanks. A simple and effective means employs a 5 per cent. solution of bichromate of potash (slightly acidulated to liberate oxygen) in hot water. The oil and hot solution are poured into a vessel and agitated continually by stirring arms. The mixture is sent through and through the floating oil and a fairly satisfactory clear oil results. Depending on the purposes for which it is intended, the refined oil may be mixed with a quantity of other oils for subsequent use. The manipulation of wool grease has not been found unprofitable in the Yorkshire district, but it must be confessed that the odor clinging to the large grease works in no way resembles attar of roses.

The deodorizing of "stiffenings" is a difficulty which vexes finishers of dress goods most in summer. Animal or vegetable compounds both smell strongly and in cases even carry their obnoxious odors into the goods. A solution of permanganate of potash is used by some English firms in conjunction with a prepared deodorant, also in solution, supplied by the makers of stiffening compounds. Of many deodorizing powders it can be said that they merely substitute one vile odor for another and it is questionable whether the permanganate solution is much improved on by any additions.

No abatement is noted in the demand for tartan dress goods and the taste for clan colors, under the lead of Paris, is extending to silks. Perhaps American manufacturers do not need reminding that tartans make desperately bad stock when their vogue is over. The prudent in this country are already taking measures to avoid the heavy loss of sales made out of due season.

The knit goods trade has evinced extraordinary vitality this fall and really re-

munerative prices have been got out of retailers. Underwear from heavy Huddersfield yarn has sold well and this is equally true of the bulky goods for miners and outdoor workers and of the more cottony fabrics for women's wear. Leicester is always an open market for large weights of thick yarn out of even harsh wastes and carded cotton.

As discussions crop up at times as to the correct pronunciation of the word frieze it may be allowable to quote a rhyme of the early 16th century:

"Cloth of gold, do not thou despise
Though thou be matched with cloth of frieze."

The Irish pronunciation therefore agrees with that used in a time now of respectable antiquity.

A WEAVING, BLEACHING, DYEING AND FINISHING PLANT.

The advantages of combining under certain conditions the weaving with the bleaching and finishing processes is well recognized, and plans for such a plant are shown in the accompanying illustrations, Figs. 1 to 10.

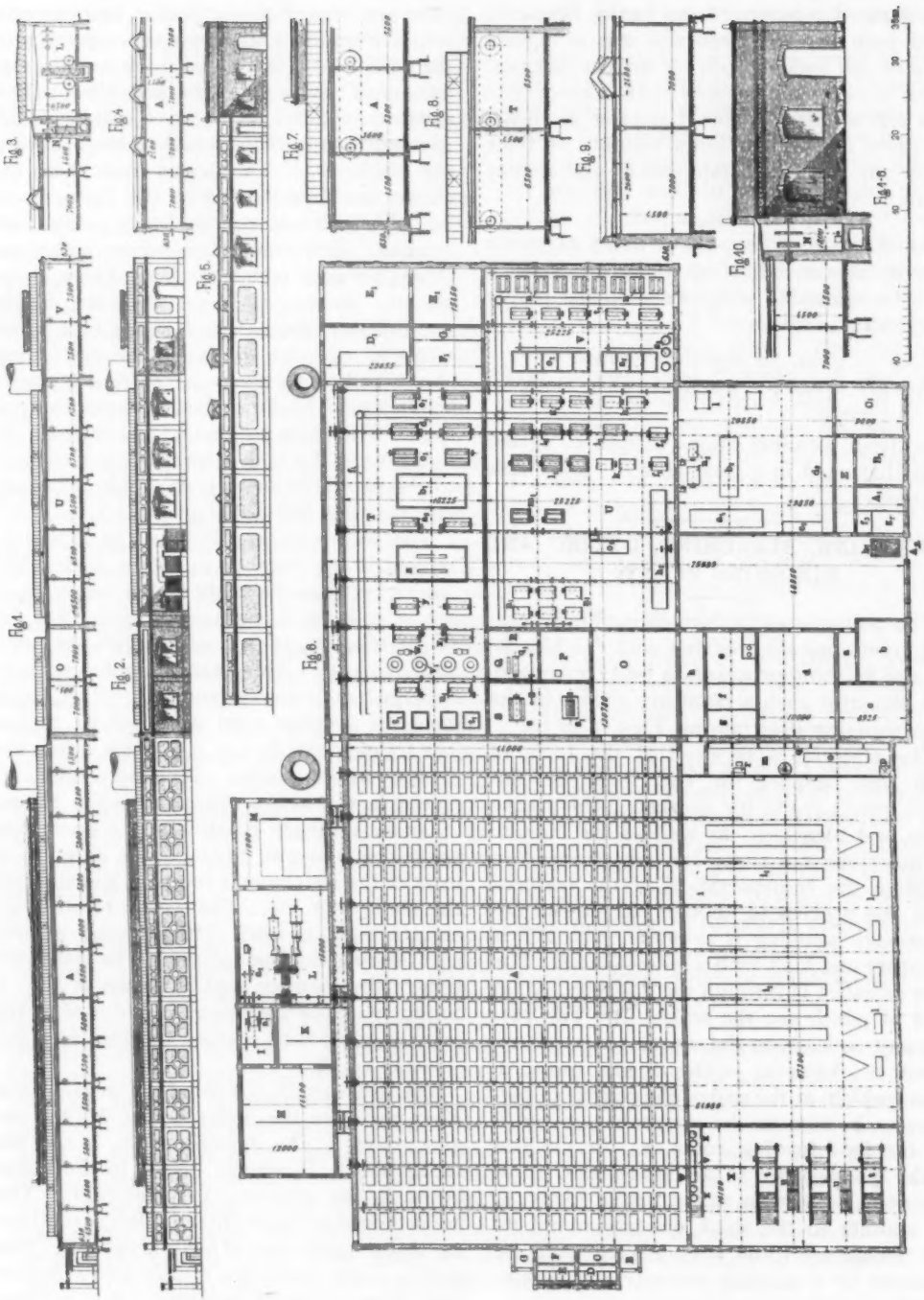
The material is received in the form of yarn and shipped in the form of finished goods ready for market. The weave room and bleachery, as well as the individual machines and processes, are arranged to facilitate the transportation of the material from one process to another, so that all unneccessary handling is avoided. The mill is one-story and built with a monitor roof. The main entrance is through the doorway, A^2, in front of which are the scales, h^2. The passageway, a, leads to the weave room offices, b and c. Adjacent is the dining room, d, behind which, at the end of the court, is a passageway, h, next to the wardrobes, g and f, and the food heating room, e. At the end of the passageway is an ante-room, from which one door leads to the weave room, A, and another to the stock delivery room, m. The last-named room is connected with the basement by a winding stairway and an elevator.

The yarn is stored in the compartment, q, and delivered over the table, o. The deliveries are booked at the desk, r, and passed to the workroom, i, through two openings in the partition. This preparatory room, i, contains five warp spoolers and three filling spoolers, each with 150 spindles. The spooled yarn is then passed to the six warping machines, l. The beams from these machines are then carried to the sizing room, X, where the warps are sized, dried and beamed. This room, X, has three sizing machines between which the beam racks, u, are placed. At the end of the room are the water and size tanks, x and w, set in a raised platform, v. The steam for the drying machines and sizing tanks is supplied from the boiler house, M, through a subterranean passage. The warp beams are taken from the sizing room back to a preparatory room, i, where plenty of room is available for warping, twisting and drawing-in.

The weave room contains 552 looms arranged in 23 rows of 24 looms each. The spaces between the posts in the weave room are as follows: Lengthways, 14½, 18¾ (2), 18 (2), 18¾, 21, 18 (3), 14½; crossways, 14½, 22¾ (5), 14½. This enables the looms to be arranged in a convenient way. The looms have an average reed width of 44 inches. The toilet rooms, b, c, d, e, f, g, are at the end of the weave room. Dividing doors are placed in the weave room and sizing rooms.

Under ordinary conditions the operatives pass from the mill through the door, h, in front of the watchman's room, f^2, and through the main door, A^2. The weave room is 4.5 meters high, covered with a wood cement roof resting on iron pillars. The construction of the monitor roof is shown at Fig. 1. Swing windows are placed in the roof at the point marked with a cross to allow free circulation of air.

The belt-way, N, is behind the weave room. Next to it are the boiler house, M, the engine room, L, the dynamo room, I, and the repair shops, H and K. Next to the boiler house is the chimney 115 feet high. The boiler house contains three boilers, each having 4,304 square feet of heating surface. The engine room contains a double steam engine with three cylinders generating 8 h. p. Between the engines is a flywheel by which the



A WEAVING, BLEACHING, DYEING AND FINISHING PLANT.

power is transmitted by twenty-two hemp ropes to a pulley on the jack shaft, which rests on two cement pillars. Two clutch couplings enable the power to be thrown on or off the mill as desired. The dynamos, a^2, for lighting the mill are driven from the jack shaft. In the room, I, is the dynamo, a', for supplying power to the finishing, bleaching and dyeing departments. The power is transmitted to the weave room shaft from the jack shaft by ropes, as shown in the plan at Fig. 6. Each set of ropes drives 48 looms which require about 12 h. p. The rope transmission is extended to the bleaching, dyeing and finishing departments which are, like the weaving department, located in a one-story building.

The woven goods are delivered to the room, O, where they are examined and then passed to the room, P, where the pieces are sewn together in lengths to accommodate the capacity of the bleaching machines. The goods are then delivered as required to the nappers, s and s', or to the singeing machines, q', in the room, Q. This singeing room is isolated by the passageway, R. After these operations the napped or singed pieces go to the bleaching room, T. The goods are treated in the soaking tank, t', to remove the surplus size, and then in the alkali tanks, u'. They are then placed in the kier, B', and treated by the circulating process according to requirements. The next operation is rinsing in the washers, y.

The alkali pumps are shown at w'. The cloth is now treated in the chemicing machines and then stored at z, to allow the chlorine to operate thoroughly on the fibre. The pieces are next washed in the machines, x', and soured in the machines, a^2. Plenty of time is allowed for the souring process, after which the goods are washed and extracted. The pieces are then opened up by the scutchers, c', and delivered to the wet calender, d', where the surplus water is removed in order to facilitate the process of drying in the machines, e'.

This completes the bleaching process. The goods are then taken to the finishing room, U, if to be finished white, or to the dyehouse, B, if to be colored. In the latter case the goods are first handled in the jiggers, n, or the foulard machine, t', then rinsed. Goods that are to be colored in the grey are delivered without bleaching direct to the black or grey dye machines, Q^2 and s^2. In the dyehouse are the tanks, s^3, in which the finishing materials are prepared for use.

Separated by a glass partition from the dyehouse is the laboratory, F', and next to this are the drug and tool rooms, H' and E'. Owing to the distance between the main boiler house and the boiling and finishing departments, a separate boiler house, D', is used for the dyeing and finishing processes. It contains a water tube boiler, 850 square feet of heating surface, connected with a separate chimney. The finishing room, U, contains various machines for producing the desired effect by this process. Part of the goods, particularly white goods, are starched in the machines, g', and then dried on the machines, i^2; next sprinkled on the machine, m', and then run through the calender, l', or the mangle i^2. Goods that must have a uniform width are starched in the machines, f', which is connected with the tentering machine, h^2. Goods that do not require tentering are treated on the equalizing machine, o', so as to equalize the width of the pieces.

The finished goods are finally treated on the breaker, n', then measured and folded, after which they are brought to the finishing room where they are pressed, folded and ticketed for the market on the tables, b^2, c^2, d^2, a^4. The measuring and folding machines, n^2, are at the left, and the cloth winder, n^2, is at the right.

The room, C', is used for storage of goods and is small because the greater part of the stock is kept in the storehouse from which the goods are sold. The offices, A' and B', are for dyeing, bleaching and finishing departments, the organization of which is separate from that of the weaving department. By this arrangement of the plant the yarn is received and the finished goods delivered at the same door, A^2.

The power for the preparatory processes is supplied by an alternating current; the motors are arranged on the group system in the belt-way. The arrangement of the shafting and belting is shown at Fig. 6. The finishing department is equipped with a special device for transporting material automatically to the different parts of the mill. The plant has an air moistening apparatus by which

the hot water is atomized and distributed to the work rooms by ventilators and fans, driven by electric motors. The mill is lighted by electricity throughout. The air in the dye-house is kept clear and free from vapor by ventilators through which dry hot air is introduced.—Uhland's Technische Rundschau.

A NEW DRYING MACHINE.

The accompanying illustration shows a new drying machine for raw cotton or yarn. It is claimed that a very large quantity of material can be dried in a very small space, the

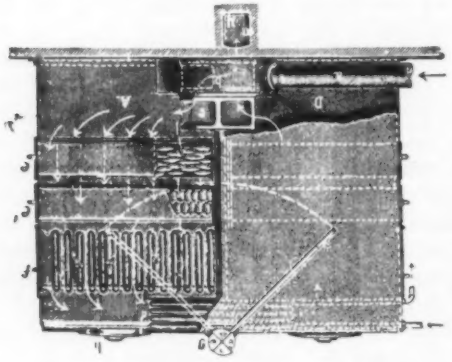


FIG. 1.

air being forced through the stock alternately in each direction. The air is rapidly heated so as to bring the evaporating power to the maximum without injury to the stock. The dryer is built in different forms to suit different kinds of material. Fig. 1 shows the plan of a machine ten feet square, built to dry 2,200 pounds of cotton yarn in skeins or on cops in ten hours. This is equal to 3,850 pounds of wet stock. Cops are placed in air-tight boxes; skeins, hung on frames. The fan of the machine is placed with the shaft upright along the line of the partition between the chambers of the machine. The fan is connected underneath with a valve arranged to admit the dry air. Above the fan is a distributing valve connected with the machine and arranged to distribute the air to the different chambers as desired. By means of this valve hot air can be forced through the stock first one way, then the other.

Fig. 2 is a side view of the distributer for a four-chamber machine; Fig. 3 is a plan of the distributer showing a part of the drying frame with the partitions. Fig. 4 is a perspective plan of a distributer which is connected by air-tight joins to the drying machine. By means of the upright wings, G, G^1, G^2, the drying frames A and B are separated from each other. The upper wing stands in the position, m n, and divides chamber A from D, B from C. The opening, o, in the casing of the distributer, is to admit air into the chamber, D. In this chamber the air rises, passing over the heating coils, shown in Fig. 1, into chamber C, then downward to B. rises again, passing over the coils, and going downward into A, where it passes into the opening in the bottom of the distributer. When the material in the chamber, D, is dry, the distributer is turned one-quarter way around by means of the lever shown in Fig. 1. The dry stock is taken out and the chamber filled with wet material. By turning the distributer the opening, O, is brought opposite the chamber, C, and as a consequence the air then passes through the chambers in the following order: C, B, A, D. Fresh material is then brought in contact with more moist air, which is advantageous for some kinds of stock. (Translated by the Textile World Record from Uhland's Technische Rundschau.)

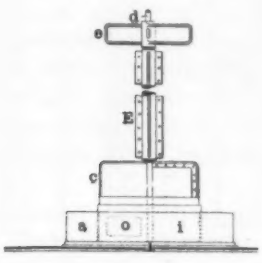


FIG. 2.

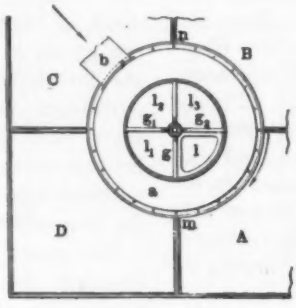


FIG. 3.

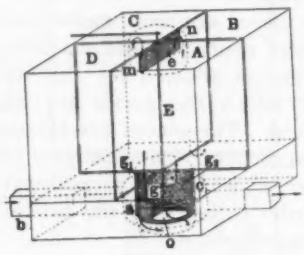


FIG. 4.

TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

OUR TEXTILE SCHOOL.

LESSON XVII.

DIAGONALS OBTAINED BY MEANS OF FILLING DRAFTING.

These weaves find extensive use in the manufacture of woolen and worsted fabrics, for which reason a description of their construction will be of interest to the reader. It is a simple method of designing diagonals, for two reasons:

First, we can use as a foundation for their construction any one of our numerous regular 45° twills.

Second, by means of filling drafting we then can obtain any number of new diagonals from any one of these numerous regular twills at our disposal. Although we may not be able to use every one of these diagonals thus designed, yet the majority of them are practical weaves, more especially such as constructed on few harnesses, as for example, from 8 to 16 harness scope.

In order to simplify the affair to the reader, the accompanying six plates of weaves are given, representing an excellent collection of such diagonals, and by means of which any number of new weaves can be readily constructed.

We will now explain how to obtain these diagonals from the 45° twills, showing at the same time how any number of these weaves can be obtained from one foundation weave.

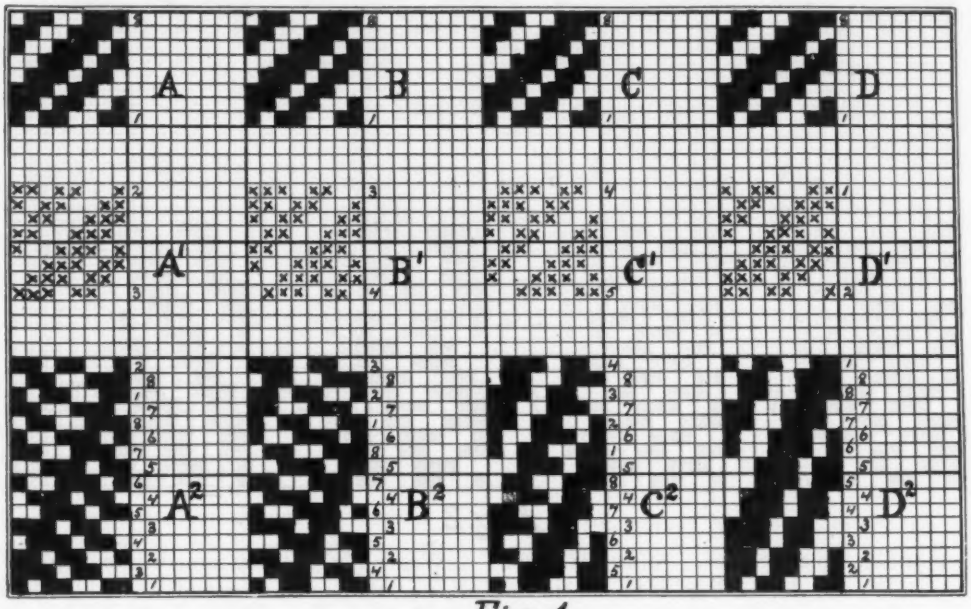


Fig. 1

For example let us consider plate of weaves Fig. 1. In A we show one repeat of the $\frac{3}{2}\frac{2}{2}\frac{2}{1}$ 8 harness 45° twill. In diagram A^1 one repeat of the same weave is shown, only in a different position with reference to starting the weave, beginning in this instance with pick number 3 if considering this weave with its position for

starting to weave Fig. A. We have indicated the starting of weave Fig. A^1 with reference to its corresponding picks in weave Fig. A, by means of numerals on the right hand side of the weave. In order to still further simplify matters, we have shown weave A by means of ■ type, showing weave A^1 by means of ⊠ type. Weave Fig. A^2 shows the diagonal as obtained by means of filling drafting from weaves A and A^1, using respectively one pick of one weave to alternate with one pick of the other; the new weave, i.e., the diagonal, consequently repeating on 16 picks, for the fact that it is a combination of two 8-pick weaves. Numerals shown on the right hand side of Fig. A^2 indicate the respective drafting of this weave from its foundation weaves, viz.:

First pick of diagonal=pick 1 of A.

Second pick of diagonal=first pick of weave A^1.

Third pick of diagonal=second pick of A.

Fourth pick of diagonal=second pick of A^1.

Fifth pick of diagonal=third pick of A.

Sixth pick of diagonal=third pick of A^1.

Seventh pick of diagonal=fourth pick of A.

Eighth pick of diagonal=fourth pick of A^1.

Ninth pick of diagonal=fifth pick of A.

Tenth pick of diagonal=fifth pick of A^1.

Eleventh pick of diagonal=sixth pick of A.

Twelfth pick of diagonal=sixth pick of A^1.

Thirteenth pick of diagonal=seventh pick of A.

Fourteenth pick of diagonal=seventh pick of A^1.

Fifteenth pick of diagonal=eighth pick of A.

Sixteenth pick of diagonal=eighth pick of A^1.

The new weave repeats on 8 harness × 16 picks.

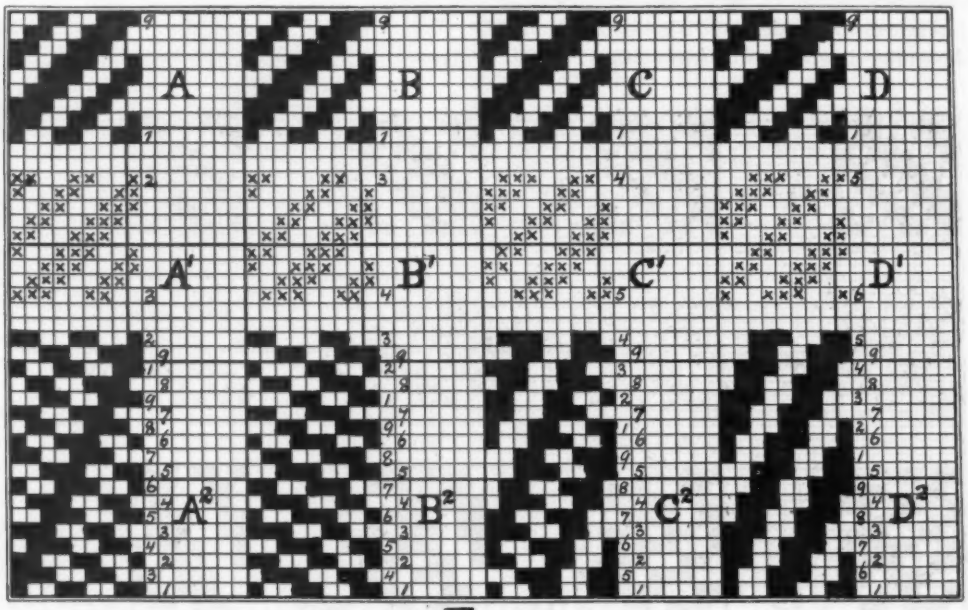


Fig. 2

Weave Fig. B is the same weave as given in A, i.e., the same position of the twill, whereas weave Fig. B^1, although the same 8 harness twill as thus far dealt with, has been started on a different pick compared to the former example. In other words, in this instance we started with pick 4 o veave Fig. B in the construction of weave Fig. B^1. Combining weaves Figs. B and B^1, alternately pick and pick, in the same manner as previously explained, in turn will result in the diagonal given in weave Fig. B^2, the same repeating again on 8 warp threads × 16 picks, and as will be readily seen is a different

weave than the one (A^2) previously constructed, although using the same foundation weave for its construction.

Diagonal C^2 in turn is the combination of arrangements of the 8 harness 45° twill, given respectively in Figs. C and C^1.

The same refers also to diagonal D^2 obtained respectively—by drafting alternately, pick and pick—from weaves D and D^1.

Examining our diagonals thus obtained from the $^3/_2{}^2/_1$ 8 harness 45° twill will at once indicate to us that in this instance we can obtain three new diagonal weaves from any one of our 8 harness 45° twills, the fourth weave obtained in this instance being nothing else but the regular 8 harness twill with two picks in a shed.

Plate of weaves Fig. 2 shows us examples of diagonals constructed in connection with a 9 harness 45° twill for the foundation, the latter being the $^3/_2{}^2/_2$ regular twill. Diagrams A, B, C and D show us, by means of ■ type, this 9 harness twill in one position, whereas diagrams A^1, B^1, C^1 and D^1 are the same weave, but in each instance starting the respective weave by means of a different pick; weave A^1 in this instance starting with pick number 3 compared to A, weave B^1 starting with pick 4 compared to B, weave C^1 starting with pick 5 compared to C, and finally weave Fig. D^1 starting with pick 6 as compared to Fig. D.

Besides showing these four different starting points of the twill by means of ⊠ type, we have at the same time indicated the various starting points as just quoted, by means of numerals placed respectively on the right hand side of the various weaves. Weaves A^2, B^2, C^2, D^2, are the four new diagonals thus obtained from the $^2/_2{}^2/_2$ 9 harness 45° twill, showing at the right hand side of each weave, by means of numerals, the respective drafting for each weave from said *one* foundation weave.

Plate of weaves Fig. 3 shows us two examples of 10 harness twills, as well as its respective diagonals obtained from it. Weave Fig. A is the $^3/_2{}^2/_1{}^1/_1$ 10 harness 45° twill. Weave

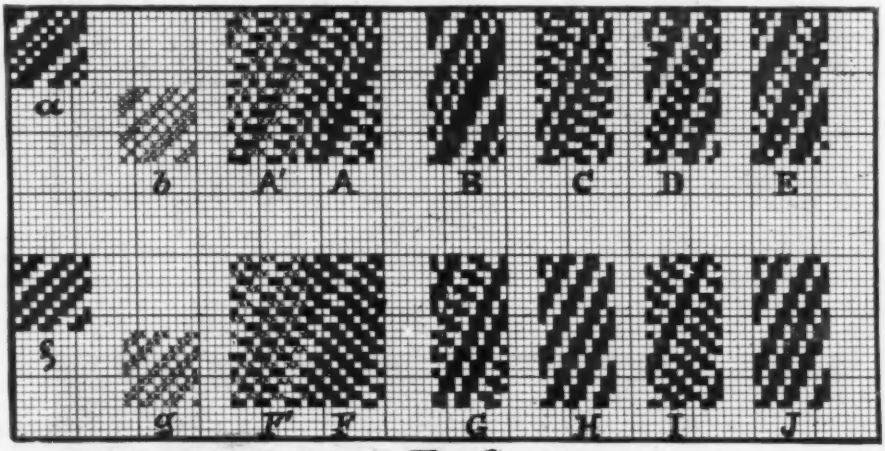


Fig. 3

B is the same weave, the only difference being that in this instance we started this weave with a different pick; pick 3 in this instance compared to weave A. Now taking alternately one pick from weave A, one pick from weave B, as shown in connection with the diagram A^1, in turn we get our new weave, i.e., the diagonal A.

Leaving weave A as shown, and starting this combination drafting every time with a different pick, will in turn produce us the diagonals B, C, D and E. Each of these five diagonals thus obtained has the $^3/_2{}^2/_1{}^1/_1$ 10 harness 45° twill for its foundation, requiring for its repeat 10 harness × 20 picks.

Diagram F shows us the $^2/_1{}^2/_2{}^2/_1$ 10 harness 45° twill, and diagram G the same weave, only

starting with pick 3, with reference to F. Combining these two weaves alternately, pick and pick (see corresponding type), will result in the new weave (diagonal) F^1, the same twill, leaving every uneven number pick identical in each diagonal, before starting to draft the foundation twill, from another pick in each instance, for every one of the even number pick

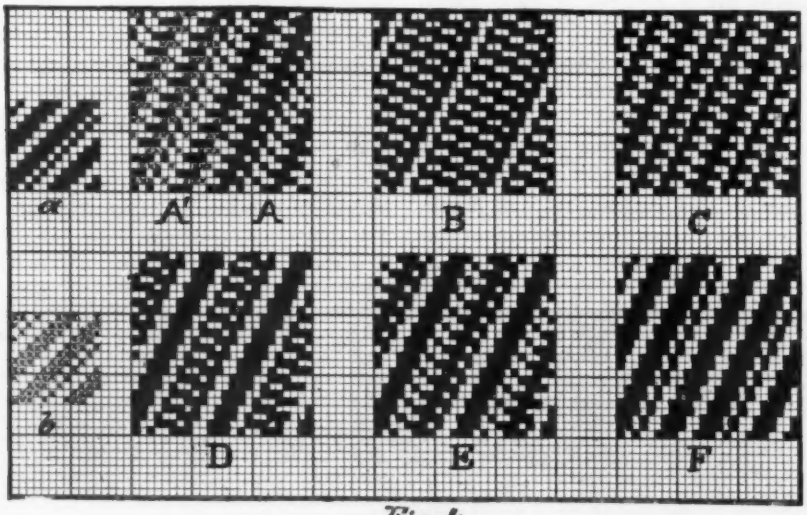


Fig. 4

being shown in diagram F in one kind of type, in order to show up the effect produced in the fabric more plainly.

of these diagonals. Weaves F, G, H, I and J. as will be readily understood, repeat on 10 warp threads × 20 picks.

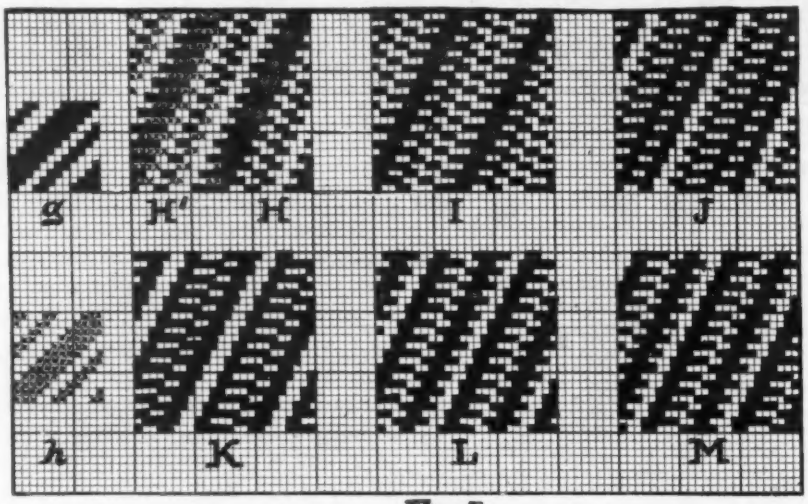


Fig. 5

Weaves Figs. G, H, I and J are respectively four additional diagonals obtained by means of filling drafting from the $2_2^2 1^2 1$ 10 harness 45° twill, leaving every uneven number pick identical in each diagonal, before starting to draft the foundation twill, from another pick in each instance, for every one of the even number pick

Plate of weaves Fig. 4 shows us a collection of 12 harness diagonals obtained from the $3_2^3 2_2^1 1$ 12 harness 45° twill, as given in con-

nection with weave A. Diagram B shows the same weave, only started with a different pick; and combining the weaves A and B, alternately, i. e., pick and pick, as shown in diagram A^1, will result in the diagonal A, repeating on 12 warp threads $\times$ 24 picks. Diagonals B, C, D, E and F are the result of starting weave B every time on a different pick. Considering weave A only, we find that the drafting for this weave, in order to obtain diagonal A, has been thus: 1, 3, 2, 4, 3, 5, etc., until repeat is obtained, whereas in connection with weave Fig. B the following drafting has been done: 1, 4, 2, 5, 3, 6, etc., until repeat is obtained. For weave Fig. C use the following drafting: 1, 5, 2, 6, 3, 7, 4, 8, etc., until a repeat is obtained. Considering weave Fig. D, we drafted thus: 1, 6, 2, 7, 3, 8, 4, 9, etc., until obtaining the repeat 12$\times$24 of this weave. Weave Fig. E has been drafted thus: 1, 7, 2, 8, 3, 9, 4, 10, etc., and weave Fig. F, 1, 2, 2, 3, 3, 4, etc., i.e., 2 picks in a shed of the regular 45° twill.

Plate of weaves Fig. 5 shows us another 45° twill for foundation weave, in order to obtain diagonals, the weave selected in this instance being the $\frac{1}{3}\frac{2}{2}$ 12 harness 45° twill, as shown in diagram Fig. G. Weave H shows the same weave, only executed in a different kind of type and starting with pick number 3 for its first pick, if compared to weave Fig. G. Diagram H^1 shows the combination of these two weaves, pick and pick, and H the diagonal executed in one kind of type. Weaves I, J, K, L and M show five additional diagonals obtained from $\frac{1}{3}\frac{2}{2}$ 12 harness 45° twill, only that in each instance we started to draft for the even number picks, every time beginning with a different pick of the foundation weave, hence the number of new weaves thus obtained. These diagonals call for their repeat 12 harness $\times$ 24 picks.

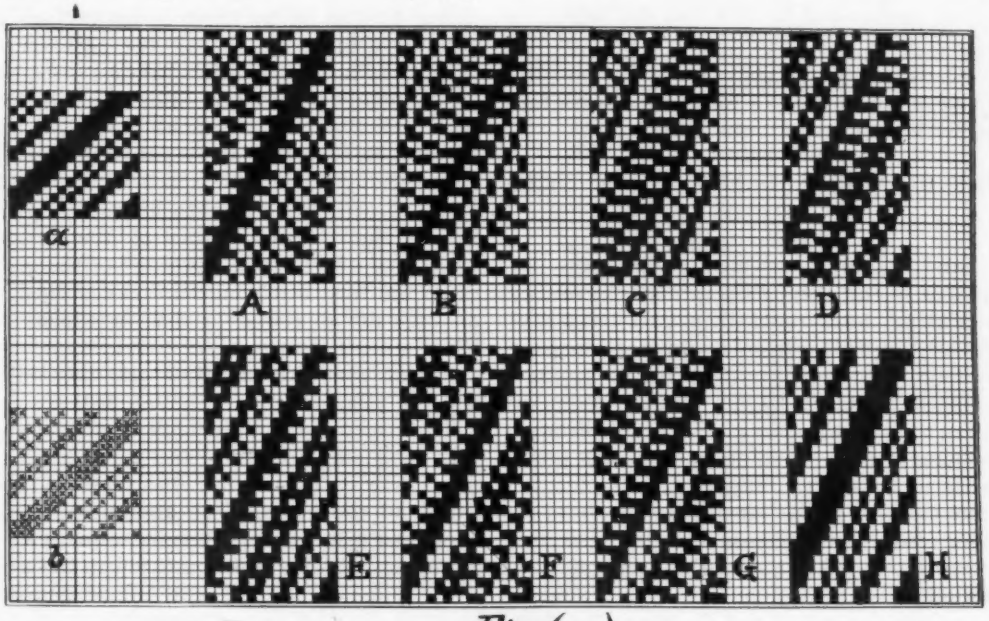


Fig. 6

Plate of weaves Fig. 6 shows us a collection of diagonals obtained from the $\frac{1}{3}\frac{2}{2}\frac{1}{1}\frac{1}{2}$ 16 harness 45° twill, as shown in weave Fig. A. Weave Fig. B shows the same weave, only that in this instance we started with pick 3, if compared to weave A. Combining weaves A and B, by draftlng alternately one pick from one weave and one pick from the other weave, i.e., one pick from a, one pick from b, until repeat is obtained, will result in the diagonal given in connection with Fig. A, repeating on

16 warp threads ×32 picks. Weaves Figs. B, C, D, E, F, G and H show different diagonals, obtained in each instance by drafting the even picks of said diagonals different, beginning in each instance with a different pick of the foundation weave. The repeat of said diagonals is 16×32.

These few examples of diagonals quoted and illustrated will readily explain to the reader the immense chance of designing new diagonals in this way from any of our regular twills, resulting in many instances in some of the best weaves for woolen and worsted fabrics. It will also be readily understood by him that the larger the repeat of the foundation weave selected, the more diagonals can be obtained from this weave, as compared to a foundation weave calling for less harnesses for its repeat.

THE GINNING AND LINTING OF SEED COTTON.

Seed cotton, after picking, in some instances is run through a cleaner previously to ginning, whereas in other cases this cleaning of the seed cotton is accomplished by passing the cotton from the bin or storage house in its travel to the ginning room or direct to the gin, as the case may be, through cleaning trunks. The purpose of this process is to break any unopened bolls, disintegrate clods or lumps formed by dirt, burs or other trash that becomes mingled with the cotton fibres and thoroughly separate all foreign substances of fine or coarse dimensions from the cotton and discharge the thus more or less cleaned cotton into a bin or direct to the gin.

Ginning has for its object to separate the cotton fibres from the husk, berry or seeds to which the filaments most tenaciously adhere. On account of the delicate structure of the cotton fibre this process of ginning must be done with the greatest of care so as not to injure the staple. The fibre, after being separated from the seed by the ginning process, is then technically known as lint. In many cases a plantation has its own gin, again some of the ginneries are located in villages or on a large scale in the interior towns, and may vary in construction and mechanical adaptation, from a rude wooden shed, in which the motive power is got from mules or horses, to a solid structure containing the most modern steam driven machinery.

Cotton intended for use in the mills in the vicinity of the cotton raising districts is, in some instances, taken straight from the field to the mill and ginned there, consequently giving such mills advantages over others, since they will carry on ginning more carefully, in their own interest, so as not to injure the staple. Cotton ginned in a defective machine is damaged either by the fibres being broken or by their being rubbed up into little knots or "neps," the presence of which, in large quantities, always indicates bad ginning; so do also sticks and broken leaf indicate poorly ginned cotton. The method employed in every gin is to pull the fibre through a narrow space which is too small to permit the seed to follow. Separation is then effected either by the passive resistance offered to the passage of the seed, or to the seed being mechanically pushed in an opposite direction to that in which the fibre is being drawn.

Cotton gins are of two types, the roller and the saw gin.

The roller gin is used only in connection with long staple cottons and where it is of the greatest importance to preserve the length of the fibres. The amount of work done, in a given time, in connection with this gin is considerably less compared to the saw gin, but which feature is of minor importance, as it is of course essential to deliver this finest of all cotton fibres to the markets without the slightest impairment of its quality.

The saw gin, the invention of immortal Eli Whitney, is the same in its principle of operation today as when invented in 1793.

The gist of the workings of a saw gin consists in that the seed cotton is held in a box, one side of which is a grate of steel bars or ribs. Through the intervals of the grate, a number of thin steel disks notched on the edge (saws) rotate rapidly. The teeth of these saws engage the fibre and pull it from the seed, which as they are cleaned fall out of the machine through a slit below the ribs.

Behind the cylinder holding the saws is a larger cylinder (the brush) filled with bristles acting in contact with the saws. Both cylinders rotate in the same direction, the brush cylinder sweeping from the saws the fibres they have detached, which by the draft created by the rapid revolution of the two cylinders are blown out from the gin.

In connection with what is known as mainland or upland or green seed cotton the seeds are not entirely freed from all lint (the name by which the ginned cotton then is known) after passing through the saw gin, there remaining (more or less short) fibres still adhering to the seed after the latter has been delivered from the gin, amounting on an average to about 10 per cent. of the total weight of the seed. These seeds, as having still some cotton fibres adhering to them, are then transferred to what is known as the linter room, which contains a number of linting machines which are specimens of cotton gins specially adapted for removing the fibres still adhering to the seed. These linting machines in their common construction, have, compared to the gin, their saws set closer, the teeth being also finer set, and in order to keep the mass of seed revolving in the hopper a toothed roller is provided at the bottom of the hopper, its teeth constantly stirring up the mass of seed so that all are subjected to the action of the saws. The linting is generally completed in two operations, the result from the first being superior to that from the second, since it contains some perfect fibres not removed in the ginning of seed cotton. The fibres, short or long, thus obtained, are technically known as "linters," and are delivered by the condenser of the linting machine as a sheet or film which in turn is either pressed in bales and sold as waste to mills, for use in connection with better staples of cotton in the spinning of cheap and low counts of yarn, or by means of rough carding transferred into a sheet or film, which in turn, on an automatic machine, is put up into one pound rolls, in which shape it comes into the market as batting, largely used as a lining for quilts, etc. The seeds meanwhile fall from the gin into a screw conveyor (preferably with a perforated bottom, to allow the escape of sand), and are either delivered directly to a wagon or into the seed house or dropped into a flue from the blower, which transports them wherever it is desired; being in turn delivered to the oil mill and there subjected to a hulling machine, which takes off the outside shell which it passes to one side, while the green kernels of the seeds go down a chute, filling certain receptacles placed in the oil press, and when in turn they are submitted to hydraulic pressure, thus producing the cotton seed oil. The remains of the green kernel are then pressed into what are termed cattle cakes, or oil cakes, for feeding cattle.

In the accompanying illustrations a specimen of an improved linting machine, as lately patented by the Continental Gin Co., of Birmingham, Alabama, is shown.

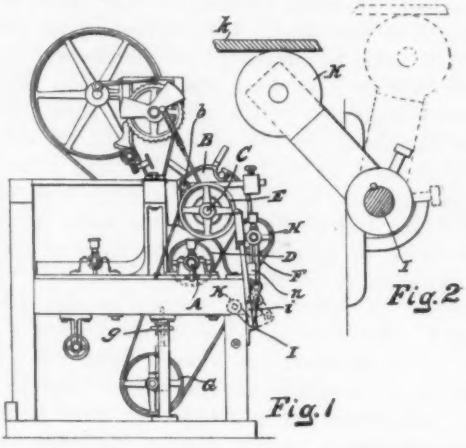


Fig. 2

Fig. 1

Among the main points of advantage in this machine are: to provide a highly efficient driving mechanism for the float, the same permitting the float to be instantly stopped when so required, for one reason or the other, also holding said float normally in its operative position. Should it be necessary to raise the linter-breast or roll box away from the saws, the float is instantly stopped by means of its driving mechanism. With reference to our illustrations, Fig. 1 is a side elevation of the gin with the controlling devices for the driving mechanism (shown in dotted lines) in the positions they occupy when the roll box is raised to stop the ginning operation and Fig. 2 is a detail section showing the operation of the breast

or box lift cam. In the illustration, A indicates the saw shaft, held in bearing in the frame in the usual way; B, the movable roll box or breast, pivoted at b, so that it can be swung up away from the saws; C is the float shaft, journaled in the ends of the roll box. The shaft A is provided on one end thereof with a pulley, D, while at its other end it has a large driving pulley (not shown). Situated immediately above and forward of pulley, D, is a somewhat larger pulley, E, fastened to the float shaft, C, the belt, F, passing in opposite directions around these pulleys and which serves to impart rotation to the float shaft. A tension pulley, G, located near the bottom of the machine, and around which the belt passes, has for its purpose to tighten the belt, in order to take up any slack or stretch in the same. This tightening of the belt is done by means of the handwheel, g.

It will be seen from the illustration that the arrangement of the pulleys is such that the tension of the belt tends to hold the roll box down to its working position, and consequently when the lint seed accumulates in said box and tends to raise the same from the saws, or to arrest the movement of the float, slippage in the driving mechanism is thereby prevented and proper results secured. Practice has demonstrated, that to secure such results in a very tight roll of seed must be run in the roll box and heretofore when the roll box has been filled with seed beyond a certain density, slippage in the driving mechanism took place, and hence the desired results could not be secured.

The idler pulley, H, which is movably mounted, constitutes part of the controlling devices for the driving mechanism, and is so connected with said mechanism that when the roll box is raised, the belt will be slackened, and in turn kept so, at the same time no ginning taking place until the roll box is again lowered.

With reference more particularly to Fig. 2, I indicates a shaft, extending across the machine and journaled on the frame thereof, being provided at one end with a crank or handle, i. Near the centre of the shaft, I, a breast lift cam, K, is secured, the same working against the rub-plate, k, which is fastened to the lower rib rail of the roll box.

In operation, the cam can be made to work across its centre, so that it will keep the box raised as seen by means of dotted lines in Fig. 2, although any suitable mechanism may be employed to hold the roll box in its inoperative position. By means of lever arm and link connections, the idler pulley, H, is so connected that when the handle of the breast lift rod is drawn forward, the idler pulley will be lowered, the belt made slack, and by the same movement the roll box is raised and held in its raised position. The reverse movement of the handle replaces the parts again into working position, in turn tightening the belt.

It may also be stated, that in connection with this modern linting machine the driving belt for the float is not tightened by the closing movement of the roll box, but, on the contrary, the closing movement of the box would loosen the belt. A separate, and in effect, oppositely-operating mechanism tightens the belt, and the latter when in operative position has a tendency to hold the roll box to its place. The roll box can only be lifted when the driving belt has been loosened. The gist of the invention can be also applied to other makes of gin.

POINTS ON THE FINISHING OF CHEVIOTS.

No doubt there are many persons, who by roughly examining a cheviot fabric, would consider that most anybody could finish them, that there is little trouble connected with finishing these fabrics; which, however, is not the case. How to finish them depends upon what kind of a cheviot we deal with, some of them being rough finished, whereas others require a close finish. By means of this it will be readily seen that in connection with the first mentioned style, the burling and fine sewing will not have to be done as particularly as is required with the latter class of cheviots, where every thread of the structure shows up plainly in the finished fabric. With reference to the fine-sewing or mending in both classes of cheviots referred to, it certainly will depend upon the style, some styles showing imperfections quicker than others,

especially if dealing with bright colors, for checks, stripes, etc., and which must be more carefully handled than if dealing with common mixtures or plain colors.

With reference to "close" finished cheviots, they have to be treated in the burling and mending room similar to fancy cassimeres, every imperfection has to be attended to in a scientific manner, so that they will not show up in the finished fabric.

With reference to the next process, the fabrics are submitted to, scouring and fulling, the first mentioned process must be done thoroughly, whereas with reference to fulling, the same will vary from one-half an hour to possibly one and one-half hours, depending upon the structure of the fabric under operation. In some instances we may come across fabrics which actually require no fulling, or, in other words, where the amount of fulling required is done during the scouring process. Use a soap with a good body in order to make the fabrics sufficiently firm and yet at the same time leave them in the pliable condition required for this class of fabrics. A soap with a good body will produce fabrics which will handle soft and pliable when finished, and at the same time will require no additional soap for the scouring process. It never will do to use a soap without body, or barely heavy enough to last during the fulling process, having in this instance to add soap for scouring; this being a wrong point of economy and in the end will cost more than if using a soap with a good body right at the start. After the fabric has been fulled to its required width, and at the same time shrunk in length if so required, scour them in luke warm water in order that all the impurities leave the structure. After scouring them about ten minutes, run the then dirty scouring liquor off and repeat the operation with fresh luke warm water. After running them again for about fifteen minutes, or more if so required, draw off the liquor again and rinse the goods for about a half hour, or more if so required, in cold water.

A great many of these fabrics require burr dyeing or speck dyeing, as sometimes called. If this is the case, drain off the goods in the washer, and after closing the gates add the particular quantity of burr dye required according to the style of the fabric, applying it in a slow, steady stream to the fabric. Running the goods for about fifty minutes in the burr dye, i. e., after you are sure that they have absorbed all that is necessary for the goods, rinse them well, and whenever possible or necessary, scour them in connection with fuller's earth, after which take them from the washer, roll them up carefully and lay them down flat, leaving them in this position to drain over night. Some finishers prefer extracting the goods, after which they are rolled up and left standing over night, whereas some finishers again take the fabrics from the washers, extract them and transfer them directly to the dryer without any medium operation between. This certainly is preferable if dealing with cheap fabrics, or such as contain cotton, and when leaving them over night might be the means of the colors running into the cotton; in fact, they will look brighter the quicker they are dried. It might be well here to refer with a few words to burr dyeing, which has for its object to cover, i. e., color dark, only the vegetable specks or impurities in the cloth; it will not affect a wool speck, which is the same as if no burr dye had been used, will have to be removed by hand finally. Burr dye is made of logwood, blue vitriol and soda ash, a good recipe for it being:

Extract of logwood	48 lbs.
Soda ash	30 lbs.
Blue vitriol	12 lbs.

This should make about 100 gallons of a burr dye that can (properly diluted) be used with safety upon almost any kind of woolen or worsted, excepting cotton mixtures. The dye will stand at about 10 degrees, and has to be diluted with cold water to suit the fabric under operation. This burr dye, as in fact all others must be used only when perfectly cold, again, it will not do to allow the goods to stand still in the liquor any length of time.

When dealing with fabrics which have cotton warp and wool filling in their structure, we must resort to different plans for burr dyeing, or else a different effect will be produced upon the cotton from that produced upon the wool portion of the fabric, for the

fact that if the dye were so made that it would produce exactly the desired effect upon the wool and cover nicely all the specks and dyes contained therein, it would be most likely to tinge the cotton in the fabric to such a marked extent as materially to affect the whole appearance of the piece. For such goods a good recipe for preparing the burr dye is thus:

Extract of logwood	175 lbs.
Soda ash	140 lbs.
Blue vitriol	90 lbs.

This produces 200 gallons of a dye which stands at about 15 degrees, and which for dark shades should be reduced to 2 degrees, and for light to 1 degree, while two and one-half pails to a 6/4 piece, and from 10 to 15 minutes' application in the washer, will give proper results. The rinsing after this is a very important step and must be carefully and thoroughly done, with a good, rich flow of pure water, otherwise goods may crack. Plenty of time must always be given for this scouring or rinsing after burr dyeing, since, unless it is well done, this result is inevitable.

In some mills special tanks or vats are supplied for burr dyeing purposes, and in which instance the fabric after being scoured, as previously explained, is then transferred to this machine. In this instance the burr dye is contained in a large, square tank, a roller frame being adjusted in the tank and on which the cloth is run from a pile outside on the floor. The cloth is thus run up from the floor and down into the liquor, being passed over the top row of rollers and under the lower row alternately. Then, just before it passes out of the tank, it is run between two large squeeze rollers, in order to save the surplus dye liquor, which thus runs back into the tank and is re-used. From these squeeze rollers the fabric is run on a roller or directly into the washers for the removal of the loose dye and final cleansing. In its passage between the squeeze rollers, attention must be paid that the cloth does not curl or wrinkle under at its selvages. By this method of burr dyeing the cloth is not allowed to remain in the dye too long at a time and the liquor is evenly and uniformly distributed over the whole piece, so that no part of the goods receives more than any other. Cloudy and shady goods will not be liable to form if care is taken. In most mills, however, the burr dyeing is done in the washer.

Any batch of burr dye should be always tested before it is used, and, if possible, kept exactly uniform for all similar styles of goods. Again, it must be applied in even and regular quantities, and the goods must always be allowed to remain in the dye for the same length of time. The dye is always best in its action when perfectly cold. However, not only must we use a perfectly cold burr dye, but at the same time the goods must be also in a cold state; and to make sure of this give them about five minutes' run in cold water after putting them in the washer, but be sure and have them well drained before running them through the burr dye tank, or adding the dye in the washer, provided no special burr dye tank is used. In the latter case, never leave water in the washer to thus reduce the dye, for such a procedure will result in uneven work. Always reduce your dye to the exact strength wanted before giving it to the goods.

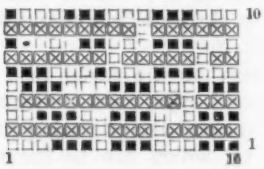
After burr dyeing, if so required, properly scouring the fabrics afterwards, the same in turn are then submitted to the dryer, after which they are ready for the shear. Some fabrics, especially rough finished cheviots, will require little if any shearing however, they will look better if the long, protruding fibres are clipped, and a run or two on the shear will be in this instance all that is necessary. In connection with close finished cheviots certainly they will require considerable shearing, which must be continued until the threads show up bright and distinct according to the style required. After shearing, the close finished fabrics are then properly brushed, both before and after pressing. Press them face to the roll on a rotary press, and when steamed they are ready for inspection, measuring and putting up for the market. In connection with rough finished cheviots, the brushing previously referred to, before and after pressing, has in most cases to be omitted.

In the 14th century pin makers were allowed to sell them in the open shop only on the first and second of January.

NOVELTIES FROM FOREIGN SOURCES.

Piece Dye Worsted (Stripe Effect).

Complete Weave. Repeat 16×10.



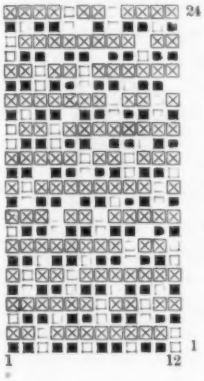
Warp—4830 ends, 2/36's worsted, 16 harness straight draw.

Reed—18×4=67 inches wide in loom.

Filling—96 picks per inch, 2/36's worsted.

Finish—Worsted face finish, nap on back, 56 inches finished width.

Piece Dye Union Worsted (Stripe Effect).



Complete Weave.

Repeat 12×24.

Warp—5220 ends, 12 harness straight draw.

Reed—22×4=59½ inches wide in loom.

Dress—

12 ends, 2/60's worsted, left hand twist
12 ends, 2/60's worsted, right " "

24 ends, repeat in dressing.

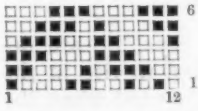
Filling—

1 pick, face 2/70's black cotton
1 pick, back 6 cut wool bac

2 picks in repeat of pattern.

Finish—Worsted face finish, nap back, 54 inches finished width.

Worsted Cheviot Suiting.



Complete Weave.

Repeat 12×6.

Warp—2400 ends, 12 harness straight draw.

Reed—12½×3=64 inches wide in loom.

Dress—

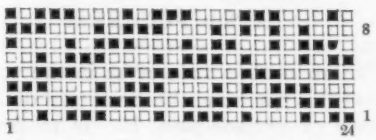
1 end, 2/24's black worsted, twisted with 2/64's worsted, black and pearl twist	=	1 end
1 end, 2/24's worsted, olive	=	1 end
1 end, 2/24's worsted, dark brown	=	1 end
1 end, 2/24's black worsted, twisted with 2/64's worsted, black and pearl twist	× 3 =	9 ends
2 ends, 2/24's worsted, dark brown		
1 end, 2/24's black worsted, twisted with 2/64's worsted, black and pearl twist	=	1 end
1 end, 2/24's worsted, dark red	=	1 end
1 end, 2/24's worsted, dark brown	=	1 end
1 end, 2/24's black worsted, twisted with 2/64's worsted, black and pearl twist	× 19 =	57 ends
2 ends, 2/24's worsted, dark brown		
Repeat of pattern:		72 ends

Filling—36 picks per inch; same arrangement, counts, color, etc., as used for warp.

Finish—Worsted cheviot finish; scour well, shear clear; 56 inches finished width.

Worsted Trousering.

Complete Weave. Repeat 64×8.



Warp—4800 ends, all 2/42's worsted, 8 harness fancy draw.

Reed—19×4=63⅛ inches wide in loom

Dress—

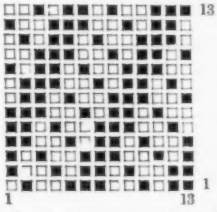
2 ends, pearl,
2 ends, blue,
2 ends, black,
2 ends, pearl,
4 ends, black,
4 ends, gray,
2 ends, black,
4 ends, gray,
2 ends, black,
2 ends, pearl,
4 ends, black,
2 ends, pearl,
4 ends, black,
4 ends, gray,
2 ends, black,
4 ends, gray,
2 ends, black,

48 ends. Repeat of pattern.

Filling—70 picks per inch, all 2/42's black.

Finish:—Worsted finish, 56 inches wide.

Diagonal Worsted Serge.



Complete Weave.

Repeat 13×13.

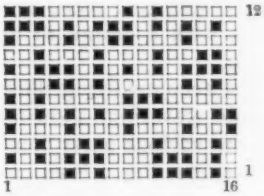
Warp—2625 ends, 2/14's worsted, 13 harness straight draw.

Reed—12½×3=70 inches wide in loom.

Filling—32 picks per inch, 2/10's worsted.

Finish—Half rough finish, full about 10 per cent.; 56 inches finished width.

Worsted Suiting.



Complete Weave.

Repeat 16×12.

Warp—7200 ends, all 2/52's worsted, 16 harness straight draw.

Reed—19×6=63⅛ inches wide.

Dress—

8 ends, black and dark blue twist,
16 ends, black.

24 ends in repeat of pattern.

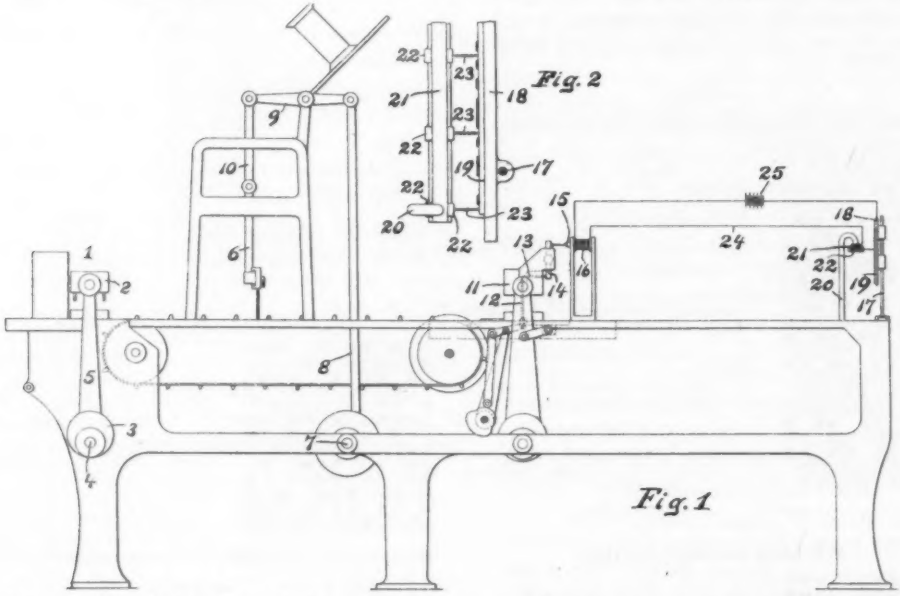
Filling—

1 pick, 2/52's worsted, black and dark blue twist 1 pick, 3 run black backing 1 pick, 2/52's worsted, black and dark blue twist	× 2 =	6 picks
1 pick, 2/52's worsted, black 1 pick, 3 run black backing 1 pick, 2/52's worsted, black	× 4 =	12 picks
Repeat of pattern:		18 picks

Finish—Worsted finish, 56 inches wide.

STAMPING JACQUARD CARDS BY MEANS OF ELECTRICALLY OPERATED PUNCHES.

The main object aimed at in the construction of this machine, the invention of Thomas Capper of Philadelphia, Pa., is to provide a device whereby the stamping or punching of jacquard cards is effected direct from the sheet or card on which the design is painted. This punching mechanism is attached to a peg hole punching and lacing machine, the complete machine being intended to produce a complete set of cards, stamped, laced and punched, in accordance with a design to be reproduced in the loom.



With reference to the accompanying illustration, Fig. 1, is a side elevation, showing in diagrammatic view the various parts comprising the complete machine; Fig. 2 is an enlarged sectional plan view of part of the machine.

In the illustration, numeral of reference 1 indicates the preliminary punching machine for punching peg and lace holes, and which has a sliding head 2, carrying the necessary punches to punch these holes, said head being operated by eccentric, 3, fast on a shaft, 4, through link, 5. After a card has passed through the punching section of the machine, it is passed by means of an endless belt to the lacing section of the machine, the vertically reciprocating needle bar, 6, of which is operated from a crank or other device on the shaft, 7, through link connection, 8, lever, 9, and link, 10.

From here on the cards pass to the ordinary "piano" type card punching machine, having a vertical reciprocating head, 11, with punches, 12, which can be locked to or released from said head by means of keys, 13, the punches being locked to the head, so as to perforate a card when keys, 13, are depressed, and being permitted to rise in the head, so as not to punch the card when the keys are not thus depressed.

The method of effecting the proper working of the punches in connection with the design will now be explained.

The keys, 13, are normally projected by springs in the usual manner, each key being held under control by a lever, 14, pivoted in the sliding head, 11, one arm of this lever bearing upon the outer end of the key, 13, its other arm being connected with a solenoid or armature, 15, of an electromagnet, 16, a series of these electromagnets, one for each lever, 14, being suitably mounted in bearings adjacent to the punching machine.

17 indicates vertical posts, which are lat-

erally movable on the frame of the machine, upon which is mounted, vertically adjustable, a plate, 18, which carries the design sheet, 19, the same, as well as the plate, 18, being a conductor of the electric current.

Upon the design sheet, 19, is painted the design, with some substance which is a non-conductor of electricity, but otherwise being produced in the same manner as in making a design in common color upon an ordinary sheet of designing paper.

Standards, 20, in front of plate, 18, support a transverse bar, 21, of non-conducting material, and mounted upon the latter, laterally adjustable thereon, are a series of slides, 22, each of which is provided with a projecting pin or needle, 23, the point of each needle, when the machine is properly adjusted, bearing against the face of the design sheet, 19, which is mounted upon the plate, 18. Each of the slides, 22, is connected by a wire, 24, to one of the terminals of its respective electromagnet, 16, the other terminal being connected to one pole of a battery, 25, the other pole of which is connected to the design sheet, 19, either directly or through the medium of the supporting plate, 18.

The number of needles, 23, employed depends upon the number of rows of openings to be punched in each card. Thus if there are to be eight rows of openings there will be one needle for each eight lateral spaces or squares on the design sheet, while if there are to be twelve rows of openings in each card, there will be one needle for each twelve lateral spaces or squares on the design sheet, as many needles being employed as there are openings in a full row from end to end of the card.

When the machine is operated the plate is adjusted so as to bring the top or bottom row of spaces or squares of the design into direct line with the row of needles, 23 (see Fig. 2), the extreme right hand square of the top or bottom row corresponding with the extreme right hand square of the top or bottom row of the design.

The current being established, the needles which bear upon blank squares transmit their said current to their respective electromagnets, 16, in turn by means of mechanism before described, projecting the keys, 13, and thus lock certain of the punches, 12, to the sliding head, 11, and cause the same to punch the card on the descent of the head. After each operation of the reciprocating head, 11, the pattern sheet is shifted laterally to the extent of one square, so as to govern the punching of the next succeeding row.

After one line of the design is covered, a card corresponding to said line of the design will have been completely punched. The design sheet is then restored to its former lateral position, and is then raised or lowered to the extent of one line, so as to be in position to govern the punching of a second card and the foregoing operations are then repeated indefinitely until all of the cards necessary for the production of the design have been punched.

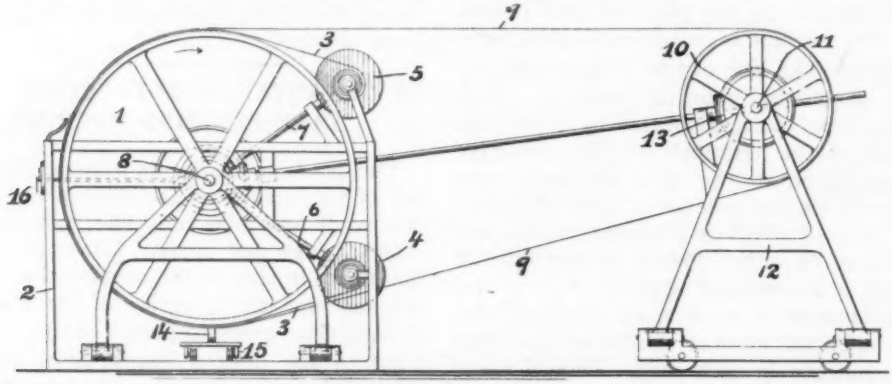
AN IMPROVED CONSTRUCTION OF A YARN PRINTING MACHINE.

This machine has for its purpose the printing of yarns, such as are used in the manufacture of loop pile and velvet pile tapestry carpets, rugs and similar fabric structures, the object in view in the construction of this new machine, the invention of Mr. Hawk of Philadelphia, being to permit the printing of yarns of any desired length, more particularly such yarns as are necessary for the manufacture of art squares, the arrangement in the new machine being such that one printing drum can be used for the printing of long as well as short lengths of yarns.

The accompanying illustration is a side elevation of this new yarn printing machine, a description of which is best given by quoting numerals of reference accompanying the illustration, and of which 1 indicates a printing drum, of ordinary construction, the same being mounted on the main frame, 2, of the machine. A blanket, 3, which extends partially around the drum, 1, winds itself up at one end on a roller, 4, while unwinding itself at its other end from a roller, 5, or vice versa, the affair depending in which direction the drum, 1, is revolving. The rollers, 4 and 5, are journaled in frame, 2, and are driven through suitable friction gears on shafts 6 and 7 respectively, from the shaft, 8, of the printing drum, 1. The yarn, 9, which passes

around the printing drum, 1, at the portion covered by the blanket, 3, also passes around an idler drum, 10, the latter having its shaft, 11, journaled in a stand, 12, which is mounted on wheels to allow the stand to be moved farther from or nearer to the printing drum, 1, in accordance with the length of yarn to be printed. The idler drum, 10, is driven from the shaft, 8, of the printing drum, 1, by means of gearing, 13, which is of such size so as to drive the idler roll, 10, at the same surface speed as the printing drum, 1.

The axis of the idler roll, 10, is somewhat lighter than the axis of the printing drum, in order that the yarn, 9, is somewhat beyond the central point of the printing drum, so as



to allow of proper contact of the printing roller, 14, with the yarn.

This printing roller, 14, is mounted on the traverse carriage, 15, which with its color box, is of ordinary construction and needs no further mentioning.

The front bearings of the drums, 1 and 10, are removable, in order to allow of conveniently removing of the yarn from the drums after the same is printed.

When yarn is to be printed the same is drawn over the top of the printing-drum, 1, then over the idler-drum, 10, and back underneath both drums, after which the ends are tied together. The machine is now started by rotating the printing-drum, 1, thereby causing a simultaneous rotating of the rollers, 4 and 5, and the idler-drum, 10, to cause winding of the balance of the yarn on the drums, 1 and 10.

During the time that the arms, 1 and 10, are being filled with yarn, the blanket, 3, is wound up on either roller, 4 or 5, and when drums, 1 and 2, are filled the outer end of the blanket is drawn onto the peripheral face of the printing drum, 1, at a point where the yarn meets the printing drum, 1. Rotating the printing drum will now cause the blanket to pass around the drum beneath the yarn, the latter holding the yarn with a sufficient pressure in contact with the peripheral face of the printing drums so that the blanket, 3, will travel with the same.

After the yarn is in proper position on the drums, the same is printed in the usual manner, with the exception, that on an ordinary drum each straw of the printed surface is represented by a tooth on a ratchet wheel extending around the end of the drum just inside of the lagging, whereas, in the present case use is made of an indicating device, 16. The latter has two hands, similar to an ordinary time clock and what would be the minute hand on a time clock would be figured from 1 to 10 for the units and the hour hand of the clock for "tens," in this way making it possible to obtain any length of printed yarn desired.

After completing printing, the yarn can be removed in the manner before mentioned, and the blanket, 3, unwound from the rollers, and removed for the purpose of washing, etc.

The high price of cashmere shawls is due to the slow and laborious process of manufacture. A fine shawl having a pattern over its entire surface is sometimes a year on the looms and even an ordinary shawl will take from four to five months.

POINTS ON THE MIXING OF FIBRES IN THE MANUFACTURE OF WOOLEN GOODS.

This certainly is one of the most important operations in the manufacture of woolen goods, it being of equal importance with reference to the successful running of the mill as the proper selection and treatment of the materials thus handled, since there is always a chance of producing mixtures differing considerably from the copy or idea we have to go by in constructing a fabric. Sometimes the mixture consists of different colored wools, with mohair, camels-hair, waste, shoddy, extract, mungo, cotton, noils in all its varieties like worsted noils, mohair noils, alpaca noils, camels-hair noils, silk noils, etc., etc.

Touching the point of shortness in the staple of material mixed in a lot along with wool, in the manufacture of woolens, it is quite true that the woolen thread is of such a structure as to admit of comparatively very short material being used. However, we must be very careful and use a wise discretion in the mixing of our materials, and under no circumstances overstep at this point by using a material either too low or of too short a staple, thinking thereby to accomplish the production of low priced yarns and goods, for it would prove a dear investment in the end, and a much better result would have been obtained by mixing a better material at higher first cost, that would have worked better, and made much less waste during carding and spinning the yarn, and finally in the process of weaving the fabric in the loom. We must keep in our mind that waste made during the process of manufacturing the yarn or cloth is such an important factor in the final result that it will be frequently found necessary to limit the consideration of first cost of the materials to be mixed, by what can be got out of the materials thus selected. It will have to be readily acknowledged by successful superintendents of woolen mills that they have often mixed materials of a somewhat higher price than was done in the mills, and yet with the higher priced materials they have brought better and cheaper yarns and goods in the market, simply for the reason that their selection resulted in a better weight of fabric and less waste made during its manufacture.

It will be readily understood that there is a chance for the manufacturer of overstepping the proper bounds of cheapness of the materials used in the construction of fabrics under consideration, on account of lack of intelligence to forecast the outcome or product of certain materials, so that in buying and judging the raw materials it is necessary to consider the producing capacity of the articles before you, i. e., to know beforehand whether their capacity of production will not more than cover any difference in cost, as compared with certain other kindred, but cheaper articles. Nothing but a thoughtful, careful selection and combination of the proper raw materials can bring out uniform and satisfactory results, for which reason, whenever possible, the party who has to mix and combine these various materials so as to produce a required style or range of fabrics should at the same time be the buyer of the various materials, for the fact that divided responsibilities in a mill most always result in friction, i. e., poor results.

At the same time, however, we must remember that the cost per pound of the different materials, even the highest cost, will not secure a satisfactory result, without due regard is paid to a proper amalgamation. Equal weights or proportions do not always admit of the strongest, smoothest and most elastic yarns at the least possible cost.

Cost and proportions of each kind of material to use certainly must be considered first, so as to obtain the value of the fabric to be manufactured, though this very often turns out to be only more or less correct.

There will be found in any lot of raw material under consideration any number of fibres which are, individually considered, more dense in compactness; again there is also the length of the staple which must be considered, since it affects the conditions of the mixing proportions very much more than the weight, and in itself will change the character and appearance of yarn and cloth made from it.

Short wools are those best adapted either for mixing of different colors or qualities, as

well as for carding purposes in the production of a good, well felted (body) woolen cloth, since in both cases we get the greatest number of points of fibre per pound of material used, and which item, where much fulling is necessary, will keep their position more firmly in the fabric, giving it in turn the desired solidity.

In opposition to this, long stapled wools are not as suitable for the manufacture of woolen goods, both with reference to mixes, as well as fabric structure; they will become released from each other and appear on the surface of the fabric, to be in turn only cut off by the shear, and thus are in turn a loss of material; they also will require a breaking by the carding process.

Successful mixings of two or more colors or qualities of material depend upon the fibres having a due proportion to each other in their length. Strength depends on evenness, and can only be obtained by an intimate association of fibres during the elongation of the yarns.

In short stapled wools there are in a given weight two, three, or four times as many points as in long stapled wools, and it is these points that give the nap or plush to the yarn and in turn the fabric.

With reference to a proper mixing, a great deal depends on the kind of yarn and the fabric required to be produced, it being a good rule not to mix different qualities too much, since a short fine wool is lost among such which is long and strong; and although it may have its use in feeding the yarn and making it look heavy, yet at the same time, its full value is partly lost.

It may be more or less difficult to see the importance of careful mixing when all the wool, etc., is of one color, whereas if two, three or four different colors are used and are mixed imperfectly, the result, a streaky yarn and in turn an imperfect cloth, will be readily seen. The damage is then prominently visible to the eye, which is not the case when all the materials used in the mix are of one color, although it is there, whether it can be seen or not.

Short stapled wools are generally preferred by woolen manufacturers in connection with mixtures, for the reason that by means of them, to a reasonable extent, woolen cloth can be constructed of a higher value, full, firm handle, good smooth finish at less cost, with more credit to producer and satisfaction to consumer.

It will be well to now refer to some of the by products and other fibres as used in connection with wool in the manufacture of woolen yarns and fabrics, viz.:

Shoddy is wool fibre recovered from worn, but all wool, long staple materials, and which had never been fulled, or if so, only slightly. Amongst these materials, we find knit goods, shawls, flannels and similar fabrics, also the yarn and fabric waste made in the process of manufacturing them. The fact tha t these materials, known in the market as "softs," are readily disintegrated, causes the resulting fibres to be comparatively long and sound, they varying in length on an average of from 2/5 to 1 1/5 inches, according to the original length of the staple in the fabric from which the shoddy is made.

Shoddy is occasionally worked up alone into heavy counts of yarn, but more generally is mixed with new wool and thus used in the manufacture of a great quantity of good average grades of yarns for all classes of all-wool fabrics.

Shoddy fibres are sometimes found to be spoiled by scales being worn off, or the ends of the fibres broken, and which may be caused during the process of rag picking or garnetting (coarse carding.) Dyed shoddy can be detected from similarly dyed new wool for the reason that the color of the former will betray the inferior article compared to the wool, since the rags or waste, previous to the re-dyeing, had been dyed different colors, and which will consequently influence the final shade of color obtained from re-dyeing accordingly.

Mungo is obtained by reducing to fibre pure woolen rags, from cloth originally heavily fulled, and when the natural consequence of the strong resistance to disintegration offered by felted fabrics, results in that short fibres, about 1/5 to 4/5 of an inch in length, are obtained. Mungo, for this reason, is never worked up again alone into yarn, but is generally mixed with new wool or cotton and generally made up into low counts of

filling yarn. On account of mungo referring to a fibre once before having been heavily felted, the same has lost its capacity for further felting.

In connection with mungo, on account of it being the shortest fibre in wastes as used by the woolen manufacturer, we find the necessity for more than average knowledge in finding out what class of wools will form a good mixture with mungoes; many good kinds of useful fabrics being made from such mixtures.

Extract wool is the product obtained by disintegrating fabrics composed of animal and vegetable fibres, chiefly wool and cotton, instead of pure wool only. The vegetable fibres in this instance are removed by carbonizing when the material has to be used in connection with wool, in the spinning of all wool yarn.

With reference to cotton as used in connection for mixing with wool, the variety known as the rough Peruvian cotton is the most important. This has a strong, rough, wooly, crinkly staple, about 1 1/4 to 1 1/2 inches long and is usually very clean and well handled. Its chief use is for mixing with wool in the manufacture of merino yarns, for which reason it is also called vegetable wool, and when carded its resemblance is so close and its characteristics so strikingly similar to wool that it would be readily sold for wool, even to a dealer. When woven into goods along with wool, the cotton fibres cannot be determined with any certainty except by using chemical tests. When mixed with wool, it reduces the tendency of the goods, in which it is used, to shrink, makes them more durable, lessens their cost of production, besides giving them a better lustre and finish; hence it is also frequently used in the manufacture of underwear and hosiery. For dyed goods it is equally suitable.

In all good mixtures the cotton ought to be a fast dye. It would be as well to remember, that, if the mixings are not thoroughly incorporated, there is nothing in any subsequent operation, nor in the ability of those in charge of them, to rectify the mistake. A proper mixing or mingling of wool and cotton will not show any specks, and as there is no fulling in the cotton, the wool must provide for it by being of good quality, whilst a warm, rather damp room is a great assistance to carry on the mixing process proper.

Worsted noils, or more properly called only noils, are the shorter fibres as are separated from the long fibres during the process of combing wool, as practiced in the manufacture of worsted yarns. They are extensively used for mixing purposes by woolen manufacturers, and actually speaking are nothing else but most suitable fibres for the manufacture of his yarns for most all kinds of woolen goods.

Camels hair noils, in the same manner, are the short fibres obtained from camel hair, The hair is of two kinds, viz., very fine, curly, reddish or yellow brown hairs, about 4 inches in length and known in commerce as camel wool, and coarse straight, dark brown to blackish body hairs, about 2 to 2 1/2 inches long. Both kinds of hair show, under the microscope, faint scales. The medullary substance always appears in the coarse hair, whereas in the fine hair it is either wanting or appears in insulated masses.

Mohair noils are the short fires as separated by means of combing from mohair, the hairy covering of the angora goat, a native of the interior of Asia Minor, but now extensively raised in Cape Colony and also to some extent here. Besides our domestic supply, mohair is also imported. It is of a pure white color (more rarely gray), rather fine, more or less curly, of high lustre, and on an average of from 5 to 6 inches long. Mohair, in a general sense, is an expansive term, covering the fleeces of goats of various Angora crosses.

Alpaca noils are the short fibres as separated by means of combing from alpaca wool, hairy covering of the alpaca, a group of animals indigenous to the highlands of the South American Cordilleras, where they are met with in a domestic as well as wild state. The group of animals in question comprise the alpaca, the llama, the vicugna and the guanaco, and of which the one mentioned first is the most important. It is a lustrous fibre, although this lustre is inferior to that of the mohair. The outer scales of the fibre are extremely fine, and the central or medul-

lary substance is present either throughout its entire length or in small elongated masses.

Silk noils is the short waste obtained by combing or carding spun silk, and in turn is sometimes used in connection with wool in the manufacture of fancy yarns for special purposes.

Skin or pulled wool is wool which is taken off the skins of sheep that have been killed, or have died from disease or other causes, and in turn is either worked up into lower grades of yarn by itself or mixed with shorn wool. Pulled wool is not clipped off the skin as is done when sheep are shorn, but the skin is rubbed with lime and water, or with acid, and the roots of the wool are thus loosened.

The wool is then pulled out by the roots, and the skin left entirely free. Sometimes, in the case of certain breeds of one-year-old sheep, the wool thus pulled off adheres so much together that it retains the form of the fleece, but usually it breaks up into smaller portions, and all trace of the shape of the fleece is lost. It comes off full of lime, and the sorter is often covered with dust, which gets into his throat, and causes much irritation.

To make a nice mix, whether composed of different colors or different kinds of stock, requires the utmost care. A large mixing room certainly will be found convenient, but it is not absolutely necessary. Provided the mixing room is small, the lots mixed certainly cannot be made larger than it would hold; but whether the lot is small or large, the same care must be bestowed on it to secure good results.

Whatever materials are now to be mixed together in such proportions as judgment may determine, according to the class of goods required to produce, the work must be done systematically. For example, let us consider a mix of wool, cotton and shoddy, and when first a layer of the wool a few inches in thickness is spread out very evenly upon a certain space of the clean-swept floor of the mixing room, after which a layer of cotton, a few inches deep, exactly covering the layer of wool, is placed upon the latter, and then a layer of shoddy is spread over the same area, each layer being leveled by the use of long rods, and each layer regulated in thickness according to the respective quantities of each kind of material to be mixed together. After this first layer of each material thus quoted, a second layer of wool, cotton and shoddy respectively follow each other again, the routine of succession being repeated until the whole of the material to be mixed is thus piled up, and which pile not unfrequently rises to a couple of yards in height, and extends over a great many yards of area, since the larger we can make the mixing, the more uniform the fabrics produced from it. The experienced workman can soon settle as to how much area he should cover with his mixing when he knows of the gross quantity of material he has to mix. When great extremes in the length of fibres are to be mixed, some medium length between should be present to properly unite them together. In such a case, the order to mix the batch would be to first mix the short and medium, as if we intended to use the two only, and then unite this mixing with the longest fibres; or supposing three kinds or lengths to be used, by mixing one half of the quantity of the two lowest with the longest, and the other two half with the shortest, we obtain two divisions, i. e., two lots of a mixture, which can be easily dealt with separately in the mixing picker, and afterwards the two mixed together as if dealing only with two kinds of material, in the same order.

The various layers of a mixing, as will be readily seen, can only be equal in thickness provided the various materials to be mixed are present in equal quantities or thereabout. This, however, is not always the case, in fact seldom.

Suppose then for an example that there are 500 pounds of one kind, or color, of wool to be mixed with 50 pounds of another kind or color. In such an instance the layer of the lesser quantity can only consist of what we may call a sprinkling, but if only a sprinkling, it must be very evenly spread over the entire area of the pile, or the mixing will be irregular, impossible to be remedied hereafter.

If again the lesser quantity gets too small

for even a sprinkling, say for example an oxford 97 per cent. black × 3 per cent. white; then take, say double or three times, or more, the quantity of the white from off the black and make a temporary mix of this, and which then use for mixing with the remainder of the black for the final mix, as before explained, making in this way the small quantity (the 3 per cent. white) more manageable.

Another example will explain mixing two small percentages with one large percentage, each of the three to be of a different color. Say we have:

1000 lbs. color A.
25 lbs. color B.
25 lbs. color C.

First mix color B and C, run through mixing picker. Then mix the combination of B and C with either

50 or 100 lbs. of A, and run again through the mixing picker; after which mix the

100 lbs. A B C with the 950 lbs. A, or the

150 lbs. A B C with the 900 lbs. A, in the regular manner as previously explained.

A like mode is followed of proceeding by layers, even if the material consists of nothing but wool of one color, since thus any unevenness in dye, drying, combined with differences in spinning properties in different portions of the wool are equalized, i. e., spread over the entire batch.

It is a mistake to suppose that an all-wool unicolor mixing does not require as much care as when dealing with wool and by-products, or wool of different colors or qualities mixed. Too great attention cannot be bestowed in order to get any mixing even, as an inequality cannot afterwards be remedied, the unevenness remaining present as a permanent defect, throughout the carding, spinning, dressing and weaving, and in turn in the woven fabric.

How to treat the large mixing pile thus formed in the mixing room is then the next point for us to consider. We explained before how carefully the square pile has been built up, layer upon layer. The pile being formed, commence pulling in single armfuls all along one side, taking a little from each layer from top to bottom. Continue this until one side of the pile has been taken away and fed to the mixing picker, always pulling the whole of the side equally, so that when the end is reached the whole side presents a perpendicular and even frontage. Repeat the procedure thus explained until the complete mixing pile has thus been worked up by the mixing picker. A great assistance to proper mixing will be found in providing a Bramwell self-feed (with a Spencer automatic self-oiler) to the mixing picker, the Bramwell feed acting as an additional mixing operation to the stock.

If the lot be composed of light and heavy stock, the gauze-room must be entered and the stock that has fallen at the mouth of the picker thrown back to mix with the rest of the lot. When a nice mix is desired, it is better to run the lot through the mixing picker a second time, for the carding engine cannot do the work of the picker.

When required to mix cotton, silk or other fibre than wool with the latter, this should be done after the wool has been oiled first and the oil has been absorbed by the wool, since if the oil comes directly into contact with either silk or cotton it prevents the cotton, etc., from opening freely in the carding process.

Now with reference to the carding engines, the latter certainly have to do their share of work to produce a perfect mix, i. e., a complete amalgamation of the various fibres constituting the batch of material under operation. The clothing of the carding engines must for this reason be in good condition, for no work can be performed by workers covered with a poor, run-down clothing, no matter what the quality of the stock under operation. Mixtures need carding, and need it badly if a uniform and sound yarn is wanted, it must be well carded and spun, or there will be trouble when it gets into the loom, and also finally when inspecting the finished fabric. Coarse and fine threads, color showing in blotches rather than even, are defects traceable directly to the mixing and mixing picker or poor carding.

The silk production of the world in 1904, as gathered from statistics published by the Lyon Silk Syndicate, amounted to 44,682,833 pounds, against 39,980,621 pounds in 1903.

A NEW CONSTRUCTION OF DRIVING CYLINDERS FOR SPINNING, TWISTING AND WINDING MACHINERY.

This driving cylinder in the machinery referred to, is also known as the "tin roller," since it is constructed of short cylindrical lengths made from tin, iron or sheet metal sheets which are coupled together, the complete cylinder being of considerable length, extending throughout the entire length of the machine, and carry the bands, which in turn transmit motion to the whirl of the

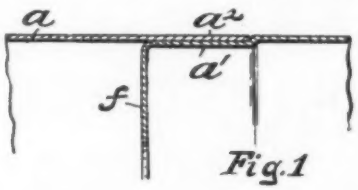


Fig. 1

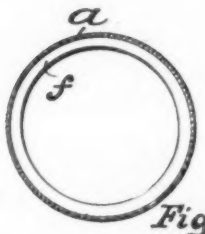


Fig. 2

spindles of the spinning frames and kindred machinery. In its general construction, these cylinders, as mentioned before, consist of a plurality of comparatively short sections, one section to be soldered to the adjacent end of the adjoining section, and forming a flush or smooth joint, being provided interiorly with a series of sheet metal disks located contiguous to and soldered to the joint portion. A shaft is secured and extends from the centre of the outer ends of the cylinder, and resting in proper journals in the frame of the machine permits the cylinder to be revolved, and thus through the bands, as previously referred to, impart rotary motion to the spindles.

The purpose of the new construction of such driving cylinders, the invention of John W. Anderson, of Pawtucket, R. I., is to reduce its weight, i. e., the amount of solder used, as well as the expense in manufacturing these cylinders, giving at the same time all the strength, stiffness and efficiency for these cylinders necessary. In the new cylinder, the individual cylindrical sections have one of their ends true and plain, whereas the other end of said section is inturned in order to form an integral interior peripheral flange, the adjacent outer portion of this end of the section being reduced in diameter a short distance longitudinally to receive thereon the plain end of the fellow section. After joining two sections they are then soldered together in order to form a solid joint. It will be readily seen that this procedure will result in a smooth and straight exterior surface to the driving cylinder, the same containing at the same time the points of advantage previously referred to.

In order to illustrate the construction of the individual sections, as well as their connection to form the complete driving cylinder, the accompanying two diagrams are given, and of which Fig. 1 represents a longitudinal section, taken through a portion of the body of the cylinder, Fig. 2 being a cross sectional view through a cylinder.

With reference to letters of references accompanying the illustrations, a indicates one of the plurality of cylindrical sheet metal sections, one end of which (a^2) is of normal diameter of the cylinder, whereas the other end of said section is swaged or reduced in diameter (as at a') to a cylindrical form to receive in turn thereon the adjacent end (a^2) of the adjoining section. The material of the reduced portion of each section is turned inwardly at right angles to the longitudinal axis, in order to form an integral annular strengthening flange, f; this being done by what is known as "metal spinning," i. e., a process wherein the said end portion is gradually transformed from its cylindrical shape to form the inturned integral flange, f.

In place of making one end of each section true and plain, and the other reduced in diameter, it will be readily understood, that if so required, every alternate section could be reduced in diameter on both sides, using then plain and true sections in connection with it, soldering the individual sections afterwards as mentioned before.

CORRESPONDENCE AND NOTES

Upon Textile Topics at Home and Abroad.

THE MANUFACTURE OF FANCY YARN.

BY JAMES AND CHARLES DANTZER.

(Continued from December.)

3. Twisted gut yarn. This is obtained by twisting several cotton threads with the ordinary single thread. Fig. 36 shows such a novelty yarn consisting of a gut thread, 1 and 2, and a ply thread, 3. This yarn is made in the ordinary way and the process presents no special difficulties. Fig. 36 is another example of this kind of yarn. The threads, 1 and 2, are first twisted together and then twisted with the gut thread, 4, after which the tie thread, 3, is twisted around them.

4. Barred twist. This thread is made by twisting two or more single barred threads with straight single threads. There is no special feature connected with the production of these effects, one of which is shown at Fig. 37. It consists of the two barred threads, 1 and 2. At Fig. 38, thread 2 only is barred. At Fig. 39, thread 3 is the only barred thread, but is very coarse in order to make it prominent. A very satisfactory result is obtained by hollowing out one roll in each pair of delivery rolls. One of these rolls is shown at Fig. 40; Fig. 41 is a sectional view. The different parts of which the roll is composed are shown at Figs. 42 to 46. They are fastened to the shaft, D, and the

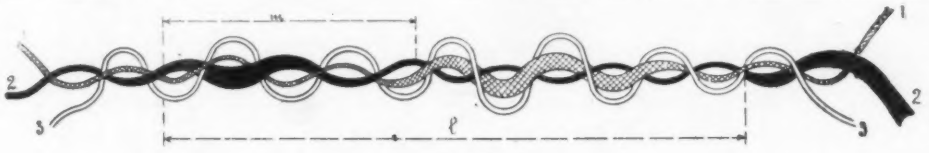


FIG. 36.

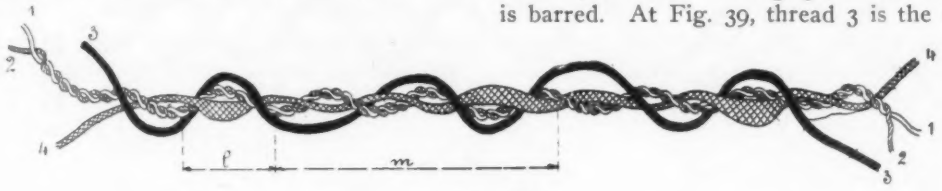


FIG. 36¹.

FIG. 27.

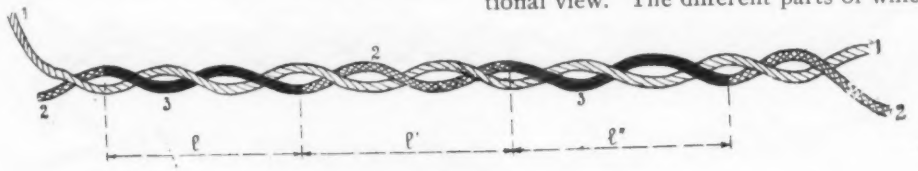


FIG. 38.

three irregular disks are held in place by two circular disks, E and F. Figs. 47, 48, show

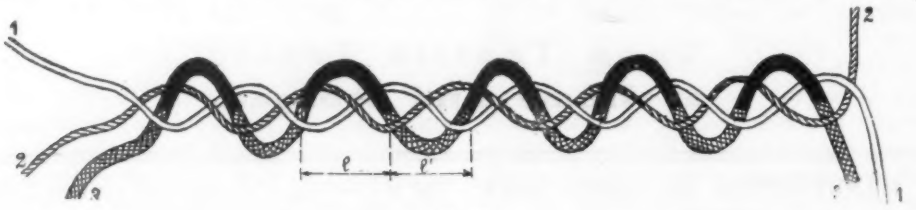


FIG. 39.

the working parts of a twister equipped with this kind of a roll. The roll is supported in the fork, J, Fig. 49, and rests on the solid

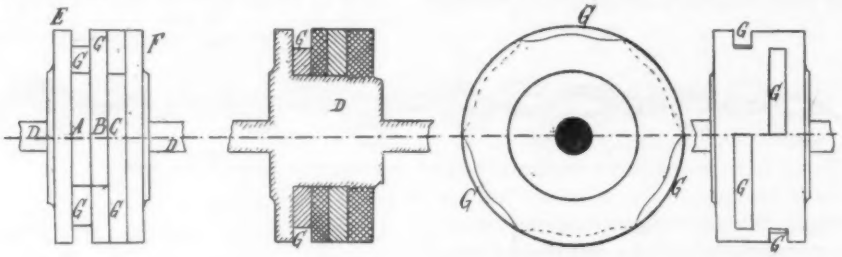


FIG. 40. FIG. 41. FIG. 42. FIG. 43.

twisting roll, K. The threads pass between the two rolls and are then twisted together.

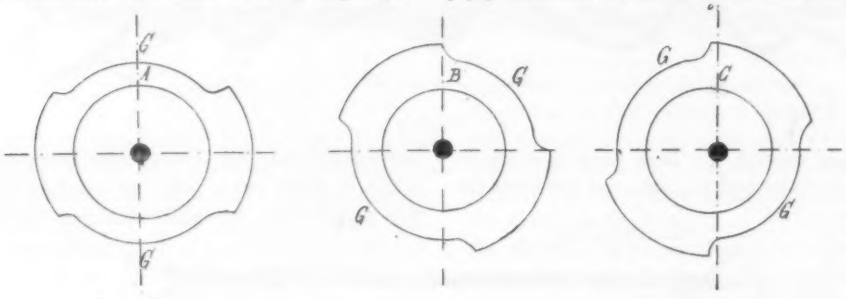


FIG. 44. FIG. 45. FIG. 46.

5. Mouline twist. This twist consists of the ordinary straight ply yarn which has been

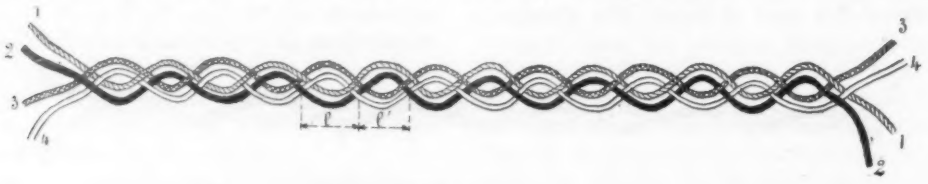


FIG. 50.

submitted to two or three twisting processes, producing a fancy effect in the finished thread. After the first operation the ply yarn is again twisted with one or more other threads in a reverse direction and with less turns to the inch. Fig. 50 shows a mouline twist composed of four strands. The effects shown in Figs. 51 and 52 are produced with only three strands for each. Fig. 53 is a 3-ply mouline twist in which the strand, 1, is coarser than the others. Fig. 54 is made by twisting a 2-ply twist with one base thread, 2, and then twisting a tie thread, 1, around the first three.

The silk covered threads are sometimes

drawn direct from the cocoon. The base thread, consisting of either cotton or silk

FIG. 47.

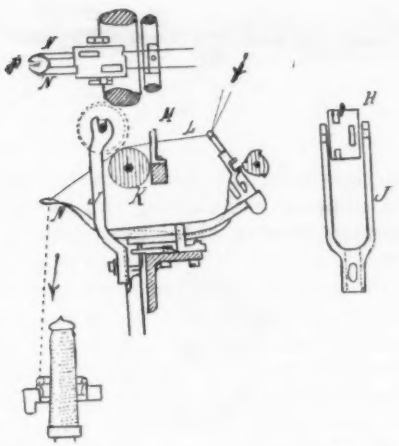


FIG. 48.

FIG. 49.

waste, is carried downward, passes into the bassines through a tube and to the spindle above. The cocoons are placed in the bassines and treated in the ordinary manner. The filaments pass over the edge of the tube to the base thread which they cover entirely. The twist is imparted by the spindle, and the fancy thread is then wound on the bobbin.

FANCY TWIST.

Button or knotted yarn. In this yarn the button or knot is formed by twisting one thread around another at one spot on the latter. Sometimes a third or tie thread is used. To make this fancy yarn on a twister it is necessary that each thread should be delivered by separate sets of rollers controlled independently of one another.

The base thread, a, Fig. 55, is delivered by the rollers, D, and the thread, d, forming the knot is delivered by the rollers, c. The knot is formed while the rollers, b, are stopped, the rollers, c, delivering the knotting thread, continuing in motion, and the yarn being wound in a bunch around the base thread, at f. There is a ring at f, through which the knotted yarn passes and which serves to keep the two threads apart till they reach this point, after which the twisted thread is wound on the bobbin.

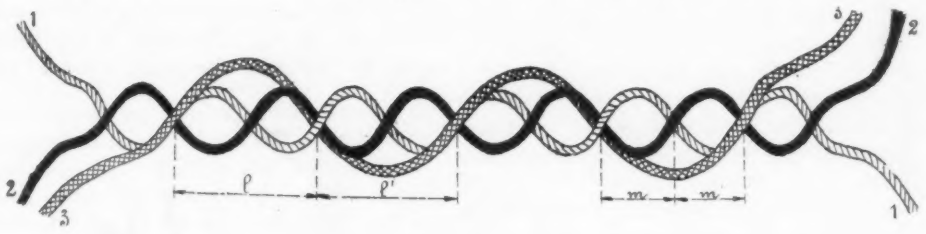


FIG. 51.

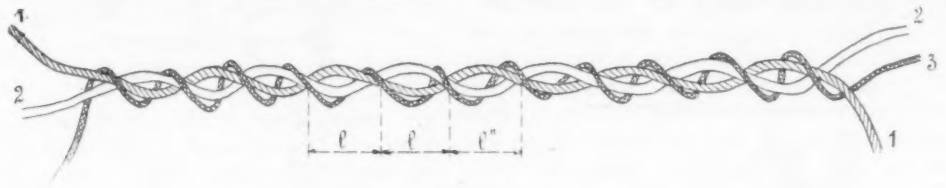


FIG. 52.

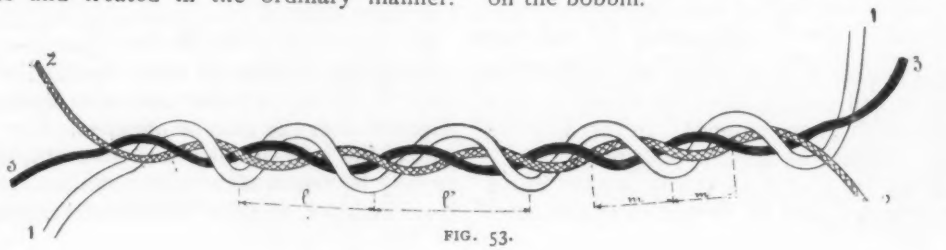


FIG. 53.

The rollers, b. can be stopped and started in a variety of ways, one consisting in the use of gears from which the teeth have been removed at intervals. This method is shown

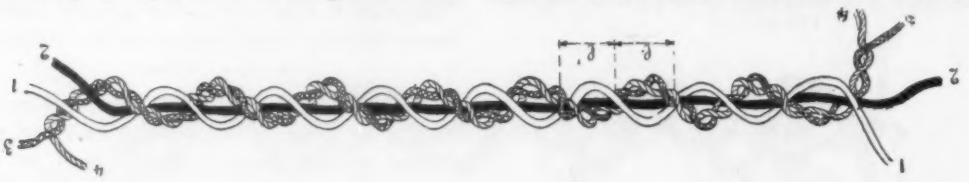


FIG. 54.

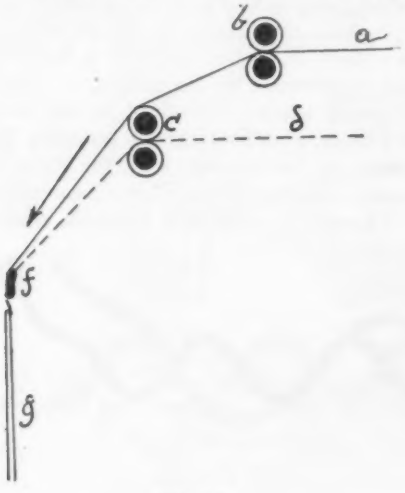


FIG. 55.

at Fig. 56. The power is supplied by the rollers, c. which supply the power to the rollers, b, by a series of gears. The teeth are removed from a section of the gear, h, so

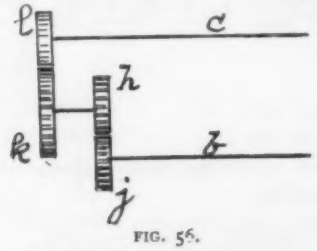


FIG. 56.

that when these blank spaces are reached the gear, j, and consequently the roller, b, connected with it, are stopped. In this way the knot is formed as already explained.

When the geared section is reached again the rollers, b, are set in motion at the same speed as that of the rollers, c. During this time when both sets of rollers are in motion a straight twist is formed between the knots. The stopping and starting can be varied by changing the size of the gear, j, or by varying the order in which the teeth are removed from the gear, h. The size of the knot is varied by changing the gears, l and k, or by

FIG. 57.

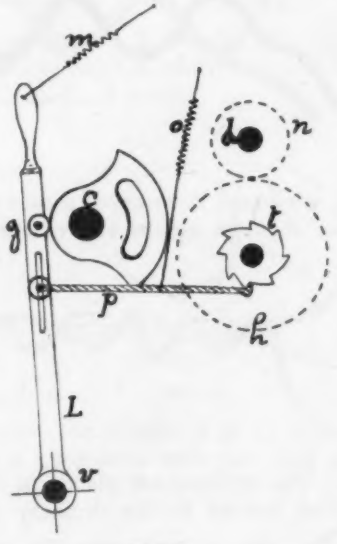


FIG. 58.

varying the number of teeth removed from gear, h. Two or three successive knots of different sizes can thus be obtained. For example, the gear, h, may have 40 teeth; then 10 may be removed, 15 left, 5 removed, and the remainder, 10, left. By similar variations

the size of and the distance separating the buttons are varied indefinitely. Fig. 57 shows a section of a gear used for such a purpose. Fortunately this gear can be run only at a moderate speed.

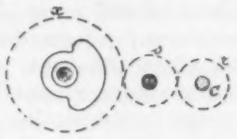


FIG. 59.

Another device for starting and stopping the rollers, b, is shown at Fig. 58. The roller, b, carries a pinion gear, m, engaging with the gear, h, the latter being connected with a ratchet, t. The rollers, c, carry a cam against which the roller, g, and the lever, T, rest. This lever swings on an axis, b. Connecting the lever to the ratchet is a hooked rod, p. Each time the cam, c, makes a revolution the lever, L, and rod, p, are vibrated, starting and stopping the ratchet, t, gears, h and m, and consequently the rollers, b. The distance between the knots can be varied by changing the gears, h and m, as well as the ratchet, t. To change the size of the knots it is necessary to place the cam on the intermediate pinion in order that the speed may be regulated as desired. This method of driving is shown at Fig. 59. The rollers, c, drive the cam by means of the gears, r and s.

(To be continued.)

THE MANUFACTURE OF SHODDY.

BY HENRY HUTTON.

In making shoddy from woolen rags, the rags are first dusted thoroughly and sorted according to quality; generally there are three grades: 1, fine; 2, medium; 3, coarse. Care must be taken to see that the rags are free from grease and oil, otherwise they will not carbonize thoroughly. A small amount of greasy rags will do no harm in the wet process, but in large quantities will leave the cotton threads showing in the batch after mixing. Special care in this respect must be taken when carbonizing by the dry process, as the heat of the machines would cause the greasy rags to ignite.

Carbonizing is done either by the wet, sulphuric acid process or by the dry or muriatic acid process. The wet process takes a longer time to accomplish the same result, as will be readily seen by comparing the two methods.

To carbonize by the wet process a kettle 7 feet long, 4 or 5 feet wide and 6 feet deep, lined with lead, is used, into which is placed a basket made with a perforated wooden bottom, solidly built and held in place by four joists of 4-inch timber, one for each corner. The basket has no sides, and is made to fit snugly in the kettle, so it can be lifted out as required. This may be done by arranging a hoist over the kettle so the liquor can drain back. Then the rags are taken to the extractor, which should be conveniently located, and thoroughly extracted. The extractor should be provided with a small well or receptacle in the floor, say, 3 feet square by 3 feet deep, also lined with lead, to receive the overflow from the extractor, and which can then be returned to the kettle.

The rags are then sent to the dryer and dried at a temperature of not less than 250 degrees F.; then, if they are to be neutralized, they are run to a washer and washed in a slightly alkaline bath, produced by adding a small quantity of soda ash to cold water in the washer, or the soda ash and water are boiled together and part of the solution added to the liquor in the wash machine. The rags are then extracted and dried.

To carbonize 500 pounds of woolen rags fill the receptacle about three-fourths full of cold water and add sulphuric acid until the liquor registers 7 Be. Enter the rags and let them soak from five to seven hours, according to the grade of rags being carbonized. Good judgment is necessary here, as the quantity of acid used depends upon the amount of cotton in the rags, the usual strength is from 6 to 9 Be.

To carbonize by the dry process the rags must first be thoroughly dusted and dried and for which a machine of special construction is required. Such a machine built by the River Machine and Boiler Works, Cleveland, Ohio, consists of an outer oven of brick, enclosing a revolving cast iron oven, into which the rags are placed; a retort for the

muriatic acid, also bricked; and two fire holes, one under the retort, and the other at the side to heat the machine. The heat is evenly distributed by means of flues arranged under the machine. The machine must be kept at a temperature of about 130 degrees F., in order to do its work properly, and the retort fire cannot be too hot while the acid is running into the retort, as that is when the work is done. The muriatic acid (22 per cent.) is placed in a 3-gallon crock and suspended on a shelf above the retort. The crock is specially made for this purpose and has an opening on the side near the bottom to allow a spigot to be driven in, and the acid runs slowly into the retort, through a small granite pipe made for the purpose. The heat forms the acid into a gas before it strikes the machine, and this gas does the carbonizing. If the acid runs into the retort too fast a moisture will be formed in the machine and the rags have to be re-dried. The average length of time required to carbonize by this process is from one to two hours.

By taking a small swatch of goods from the machine and rubbing it between the fingers it can be determined whether the process is finished; if so, the cotton in the rags crumbles to dust. The batch should then be drawn from the machine, and the machine reloaded as rapidly as possible, so it will not become cooled. By this means another batch can be carbonized while the first is being dusted and washed.

This process does not affect the colors of the goods as much as the wet process, and they may be brought back to their original colors by the use of a small quantity of a soda ash and soap solution. To prepare this solution, fill a barrel with water and add one pail of soda ash and 10 pounds of soap; boil until the soap is dissolved, when it is ready for use. About three pailfuls of this liquor is added to the water in the washer. The rags are then taken to the duster, dusted thoroughly, washed well, extracted and dried.

The duster, extractor and washer should be placed as near to each other as possible and allow room to work comfortably. To carbonize 500 pounds of woolen rags by the dry process requires from 30 to 40 pounds of muriatic acid (22 per cent.)

The rags are now ready for picking. The batches are laid on the floor beside the picker or in the bins provided for the purpose, putting in a layer of each grade used, and sprinkling with a solution of equal parts of wool or lard oil and water. The mixture should stand about ten hours before picking, in order to allow the rags to absorb as much of the moisture as possible, as they then work better in the picking and carding. Care must be taken that all foreign substances, such as wood, nails, pieces of metal, etc., are removed from the batch before picking, as they are liable to cause a fire in the machine.

THE CAUSES OF DEFECTS IN FABRICS.

BY ALFRED F. BARKER.
Professor of Textile Industries, Bradford Technical College.

(From a lecture before the Society of Dyers and Colorists.)

(Continued from November.)

The strengths of the different materials and yarns are illustrated in Figs. 13 and 14. The

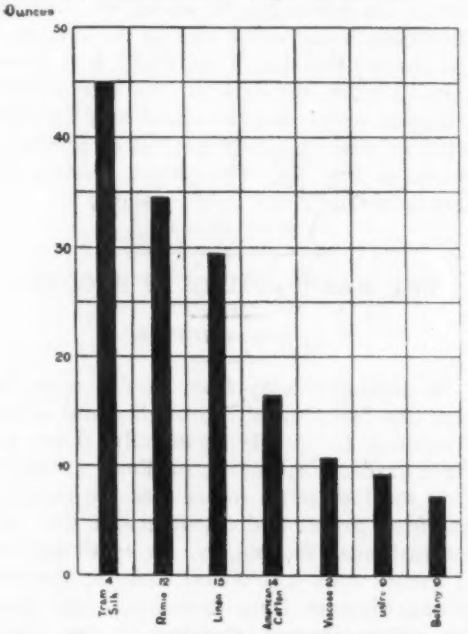


FIG. 13. THE STRENGTH OF MATERIALS.
Counts of yarn equivalent to 1/30's Worsted.
Yarns tested with respective normal amounts of twist.
Turns per inch shown at the bottom of Strength column.
1 inch tested to obtain first fibre break.

height of the column here represents the strength of the yarn. It will be seen from

these diagrams that pure net silk is by far the strongest, and that a lustre yarn comes down very low indeed. Fig. 13 shows the breaking strain of the fibre, and Fig. 14 the breaking strain or perhaps slip of the yarn. These diagrams illustrate the difficulties which manufacturers have to contend with. There is a marked difference in taking an inch of yarn and breaking it and in taking 27 inches of yarn and breaking it. Actually in weaving we shall have the 27 inches under strain at the same time; thus it is usually better to take 27 inches for the tests. On the other hand, if we wish for the absolute strength of the material it is necessary to eliminate the possibility of fibre slipping by taking one inch of yarn, so that both ends of the fibres are between the nippers of the machine.

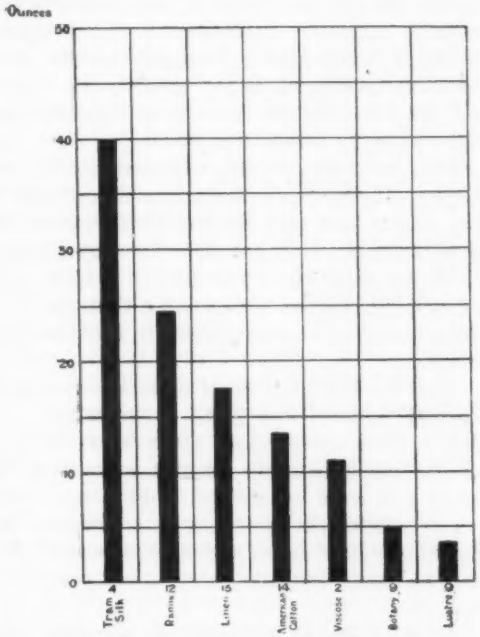


FIG. 14. THE STRENGTH OF MATERIALS.
Counts of Yarn equivalent to 1/30's Worsted.
Yarns tested with respective normal amounts of twist.
Turns per inch shown at the bottom of Strength column.
27 inches tested.

This matter of testing the strength of yarn is very important, and I should like to draw your attention to the patent yarn testing machine invented by Mr. Moscrop, and put on the market by Messrs. Cook & Co., of Manchester. The idea of the makers of this machine is in the first place that we should not simply take one test to get a satisfactory result, but that we should take a number. More important still, by this means we eliminate the human factor. The spool of cotton is put into the machine, and the machine automatically tests length after length of the yarn, and records the results by pin pricks upon paper records. Thus we may see at a glance not only the average breaking strength, but whether there are any weak places or defects in the yarn. In textile work we frequently find comparative results very useful. We employ this method, for instance, in testing the counts of yarns and in many other ways.

Referring now to synthetical research, we note that experiments carried out in which various defects are purposely introduced at various stages of the manufacture, are most useful and interesting. For example, we specially wove some lustre patterns with a view to discovering the cause of certain defects by reproducing these defects under Insert Caption
known conditions. Thus, for instance, variations were made in the quality of the cotton, in the twisting in the spinning, in the tension of the warp, etc., and the final results, after dyeing and finishing were noted, as well as the results in the grey. In certain cases the grey appeared absolutely perfect, but when finished developed a very marked stripe. In such a case the manufacturer would naturally say to the finisher "our 'looker-over' never saw anything; you have caused the defect." I simply wish to point out that the stripes in lustres or other goods may be developed by the finisher and yet they may be already present and to simply charge the dyer with causing the defect is not satisfactory even to the manufacturer. By going deeper into the matter he would probably benefit himself and the trade. This method of research by reproduction is in my opinion most valuable as we thereby gain knowledge of both direct and indirect value.

I cannot conclude my lecture without a reference to the question of standardizing. We are a long way from standardizing in our work, either in reference to the raw material, tops, yarns, or fabrics, but I do think we could in many cases standardize under (a)

natural properties or (b) artificial properties:—(a) The length of the wool fibre we cannot alter, but we can standardize the lengths for the various qualities, or, if necessary, take a ratio of length to diameter; (b) the twist in our yarns, or the variation of twist in our yarns, rests with ourselves, and is therefore an artificial property.

It seems to me that if those who have to deal mostly with the natural properties would try to standardize, fixing definitely what may be termed a long English top, also what should be termed medium and short or botany top, then spinners would definitely decide as to what amount of variation upon these standards was admissible. Then they could further decide as to what variation should be allowed in the diameter of yarn, as to what variation should be allowed in twist, and then in the case of fabrics if the variations in set and picks and shrinking property were standardized, we should have many disputes—which are at present causing a good deal of trouble and bad feeling—very quickly settled. We shall not develop any standards in tops, yarns, or fabrics in a week or a month, but I do think if the trade makes up its mind that it is going to standardize where possible we shall get standards in many cases where none exist at present, and the result will be that, as I have said, a good deal of bad feeling will be obviated.

Finally, all this research to which I have been referring simply emphasizes this point, that we must have accurate workmanship whether it is in conducting a research or actually designing or producing fabrics. Accuracy in workmanship is one of our primary needs. Again, so many workmen and heads of departments can do a thing once and cannot do it again. It seems to me that if we can get into our work more "scientific method" we shall develop the trade and benefit ourselves. By scientific method I do not mean merely the use of microscopes and elaborate instruments, which I am afraid many associate with scientific work. It seems to me that a much more important thing is the attitude which one takes with regard to one's work. What we lack more than anything else is that scientific attitude and quality of mind which will enable us to face difficulties, and not only to face them, but to overcome them in the best possible way.

LETTERS TO A YOUNG WOOLEN FINISHER.

II.

Dear Henry:—Your letter informing me of your trouble in having the goods come cockled from the fulling mills is at hand.

You are certainly "up against it," and will have to locate the trouble, or the cause of it, whether it be in the finishing room or not.

If we were sure it was your fault, we could very soon remedy it, but the worst feature about cockles is that the cause may be in almost any department of the mill, and the other overseers are too often disposed to lay the blame to the finisher, because the trouble manifests itself there. Then again, there is sometimes a tendency on the part of some overseers to try to shift the blame on the other fellow, instead of honestly endeavoring to locate the trouble.

This tendency to shift responsibility is not always due to pure meanness, though often so. Some men that are experienced in other departments, have not had the opportunity to study cause and effect in this matter, and do not fully realize how small a thing in their department will cause trouble in the finishing room.

You remember what trouble we had with the old "boss picker man," as we called him, before he could see how his careless mixing of the stock brought on this same trouble when you were my second hand.

Of course, the tendency is to blame the finishing department, and it may possibly be caused there, but the chances are that it is not.

Anyway, let me tell you it is certainly "up to you" either to correct it or to prove that someone else should.

Of course, you have taken a good course in adopting precautionary measures in regard to having your soap sufficiently strong, and seeing that it goes on the cloth evenly and uniformly.

This is a step in the right direction, but you want to assume that the trouble may be in some other department.

It is a very easy matter to correct the trouble if it is caused in the finishing room, but it is a waste of time, soap and possibly a great amount of profanity to endeavor to right a wrong that has originated in the making of the yarn or the weaving of the cloth.

What constitutes cockled goods? Simply an irregularity in width. Although the trouble comes to light more distinctly when the cloth is fulled, the real cause may as likely be in an irregularity in the yarn or the weaving as in the finishing.

In the picker room, especially where there is a combination of wool and shoddy or wool and cotton, too much care cannot be exercised in mixing and blending. If carelessly done, the stock may be fed to the cards unevenly, so that at times the percentage of low stock may be greater than at other times and the yarn thereby be very irregular, both as to weight and quality.

You will readily understand that where a part of the filling has more than its due amount of low stock, and another part more than its share of the wool, and good fulling stock, the result must be uneven cloth from the fulling mill, in spite of the finisher, his soap or his "cuss" words.

Any variation in the size of the filling yarn, whether it be caused in the carding or spinning, will tend to an irregularity in the cloth that may lead to cockles.

Even careless steaming of the yarn, whereby some bobbins get saturated with the exhaust steam, will sometimes cause trouble, for it will lead to uneven weaving, and where cotton warp goods are made this alone will produce cockles.

There are various causes for uneven work at the loom, even when the yarn is all right. If the friction upon the warp beam is irregular, the cloth will be correspondingly uneven in weight, having light and heavy places that will full unevenly. If the beam is warped, or its journal or shaft, the result will be the same, and will surely cause trouble.

The causes for cockles that originate in the finishing room are not many, but are just as serious as those in other departments.

I am sure you know what these are, but we will call them to mind again, so as to cover the ground thoroughly. If the soap is too weak, its alkaline strength becomes exhausted before it has fully accomplished its work, and there will be places in the cloth where the grease is not fully or perfectly saponified, and at these points the fulling will be slow and imperfect, and thus cause uneven fulling.

The remedy for this is very simple. Just add more alkali to the soap until it is of proper strength to saponify thoroughly all the grease the goods contain.

Sometimes the trouble will arise from hasty or careless soaping, even when the condition of the soap is all right.

If the soap is put on irregularly, so that the cloth is wet only in spots, the fulling will begin in those places first, and even though the cloth becomes evenly wet later on, these places get started in advance, and will keep in advance, so that the cockles are produced from the beginning.

I once had a man working for me that was one of these know-it-all fellows, and he insisted upon having his own way, saying he guessed he had run fulling mills long enough to know how to turn the soap into the machine.

The time he employed in turning one bucket of soap on the cloth was about sufficient for the cloth to go half way round the machine. In other words, this one bucket would go on only half the cloth. Now if the next bucket should begin to go on at the same point where the first one did, the other half of the cloth would still remain unsoaked. You can readily see what the result was. He was soaping only one-half the cloth. To be sure he put on enough soap, but one-half did not get its share until the other half had quite a start in fulling.

The soap should be put into the mill slowly, so that the cloth may make a number of revolutions during the application of each bucket. By this method, the cloth will be evenly wet, and all parts will begin fulling at the same time.

If you have a soaping machine, the work will be uniform if it is kept well supplied with soap.

Do not use it until it is nearly empty, and then add more soap, for you will have trouble if you do. Keep it well filled all the time by adding soap often. By this means the strength of the soap, as well as the quantity, is kept up to the requirements.

Upon very heavy goods I have often found it best to run the cloth through the soaping machine the second time. It not only ensures uniformity, but the time employed is made up by the promptness with which the fulling begins, the grease being more thoroughly started and combined with the soap.

Whatever the cause, you have done right in being specially careful in soaping the goods, and now how can we proceed to ferret out the cause of the trouble?

Take one of your bad pieces, after it has been scoured and thoroughly extracted and examine it over a perch, or what is better, over a long table that is wide enough to permit the cloth laying out full width.

If the table can be placed so that the light will fall upon it crosswise, then all the better, for it will show up the uneven appearance to better advantage, or worse advantage, if you like.

If the wide and narrow places show in distinct changes from wide to narrow straight across and all the way across the cloth, indicating the change of filling from one bobbin of filling to another, you may be sure the trouble is in uneven filling.

Where the trouble is in a variation of the filling, it will show in distinct changes directly across the cloth, very often in widths that one or more bobbins will weave.

If the trouble is in the uneven tension of the warp, caused by a fault in the beam or its friction, the uneven places will appear regularly at uniform intervals corresponding with each turn of the beam.

Cockles caused in this way will not show the change abruptly, but will run gradually from wide to narrow and narrow to wide, but may be determined by the uniform distances which separate them.

Finishing room cockles may be distinguished by the entire lack of any uniformity. It is impossible for cockles caused in the finishing to show exactly straight across or at uniform intervals, and where these peculiarities prevail it is best to look in other departments for the trouble.

As a rule, finishing room cockles will show long wrinkles in the middle of the cloth, and shorter ones near the sides. If any portion of the cloth suffers in fulling, it is more likely to be the middle, as the selvages are usually more exposed in the mill, and receive the soap more readily.

With these few hints and a careful examination of the cloth as indicated, I think you may be able to draw some conclusions that will aid you in locating and overcoming the difficulty. Above all, don't lay the blame to any other department until you are able to show some proof, or at least an indication that you are right.

If the other overseers are disposed to join in the matter, suggest to them on the lines I have indicated, and if there is harmony of action, I am sure the trouble will soon be corrected. Yours truly,

TURNER.

FLY FRAME CHANGE GEARS.

BY J. T. B.

There are several change gears on the fly frame, some of which are changed every time a change is made in the hank roving being produced. Others are changed to accommodate certain conditions, after which they are practically standard gears. The principal ones are the draft gear, twist gear, tension gear, lay or traverse gear and taper gear.

DRAFT GEAR.

In explaining the uses of the various gears it may be said that the draft gear is the governing factor in the making of a roving of a required weight or hank. It controls the draft or reduction of the sliver or roving being fed. The back and middle rolls are generally driven by the draft gear, while the front roll revolves at a constant speed. The exceptions will be mentioned later when dealing with the twist gear. Any change in the size of the draft gear changes the speed of the middle and back rolls, thus changing the ratio between their surface speed and the surface speed of the front roll and varying also the attenuation of the roving being fed.

For example, suppose we have a draft change gear (d. c. g.) of 40 teeth, giving a draft of 5, what draft would a 50 d. c. g. give?

The 50 gear will drive the back roll at a higher speed than the 40, thus reducing the ratio or draft as follows:

$40 \times 5 \div 50 = 4$ draft when using a 50 gear.

In other words a 50 gear will feed one yard to every 4 yards delivered, while the 40 gear will feed only one yard to each 5 delivered; but, if the one yard fed is the same weight in each case, the weight per yard delivered with the 50 gear would be equal to 1/4 of the weight fed, while the weight per yard delivered with the 40 gear will be only 1/5 of the weight fed.

TWIST GEAR.

After the roving has been drawn to the required size by the drawing rolls, it becomes necessary to impart twist to the strand as it emerges from the front roll, in order to enable it to stand the tension in the creel of the next machine. The heavier the roving the fewer the twist or turns per inch required to give sufficient strength. The amount of twist is governed by what is known as the twist gear, which in most fly frames is situated on the foot ends of the jack shaft, and drives the rolls through the top cone shaft which is driven from the twist gear by means of an intermediate gear.

The spindles are driven at a constant speed by gearing direct from the jack shaft. We will assume that they are making 1,000 revolutions per minute, and that a gear is being used which is delivering 500 inches per minute from the front roll. The twist in this case would be $(1{,}000 \div 500)$ 2 turns per inch.

Suppose, however, we substitute a larger twist gear. The speed of the front roll is thus increased while the spindle speed is the same; and if we increase the speed of the front roll so as to deliver 800 inches per minute, we obtain $(1{,}000 \div 800)$ 1 1/4 turns per inch.

These illustrations show that a larger twist gear puts less twist in the yarn, while a smaller twist gear increases the twist. The production of a fly frame is also influenced by the size of the twist gear. If the roving can be made just as satisfactory with a larger gear, the change would increase the production by increasing the speed of the front roll, and thus delivering a greater length in a given time. In addition to excess twist reducing production, it may also seriously influence the character of the work done on the next process by offering too much resistance to the drawing rolls; and in place of allowing the strand to be drawn evenly, it will emerge from the rolls in thick undrawn bunches; at the same time destroying the leather covering of the rolls.

TENSION GEAR.

The tension gear regulates the distance moved by the cone belt at the end of each lift or traverse of the bobbin rail. During the building of the bobbin the belt moves from the small end of the bottom cone toward the larger end, moving a short distance at each traverse or change of the builder. As the speed of the bottom cone regulates the speed of the bobbin, any change in the speed of the bottom cone will cause a change in the speed of the bobbins. The roving is delivered at a practically constant speed, therefore, unless it is wound on the bobbin at an equally constant rate, the thread or roving between flyer or bobbin and front roll, will either run slack or be too tight and thus strained or broken. The constant rate referred to when speaking of the winding on of the roving must necessarily mean the relative surface speed. This depends upon the diameter of the bobbin, which, on a fly frame, is continually changing during the building of the bobbin.

If a constant or equal length is being delivered by the front roll per minute, and the circumference upon which it is being wound is constantly changing, there must be a change in the speed of the bobbin to offset its varying circumference. This speed change must be governed by the rate of increase in the diameter of the bobbin. If one bobbin is composed of roving twice the diameter of roving on another bobbin, it is obvious that the speed variation at each layer of roving will be greater with the former than with the latter. This is accomplished by moving the belt a greater distance along the cones at each change, and thus keep the surface speed of the bobbin in proper relation to the flyer, although the diameter is increased as every layer is wound on.

If the roving is made finer the belt must not move as far at each change, because the bobbin will not require so great a change in

speed owing to the fact that the fine roving does not increase the diameter as much as a layer of heavier roving. This rate of belt traverse is regulated by the tension gear, so called because it regulates the tension on the roving between the front roll and the bobbin.

THE TRAVERSE GEAR.

This gear, also called the lay or lifter gear, regulates the speed (not the distance traveled) of the bobbin rail or carriage, and works with the tension gear to form a firm well built bobbin. If the adjustment of one is wrong it affects the working of the other.

If the lay gear is too large and is a driver, it will drive the carriage too fast; therefore as the roving is wound around the bobbin there will be too much space between each coil; and the next layer, instead of lying on the folds of the previous layer, will sink into the spaces and build an uneven bobbin, as well as cause the roving to break in the next process. If the lay gear is too small the coils will be crowded and after several layers have been put on the bobbin, the roving will begin to slip over the ends of the bobbin and cause what is termed slattering.

TAPER GEAR.

The taper gear regulates the length or distance traversed by the bobbin rail. Its object is to shorten the length of traverse at each change of the builder, thus forming a bobbin with conical ends which permits handling without danger of forcing the roving over the ends of the bobbin, or allowing them to run over when building. This gear is usually driven from the cone belt rack, so that the movement of the rack shortens the traverse.

CONE GEAR.

In addition to the foregoing there is another gear which is changed to affect the speed of the empty bobbins. This is known as the cone gear and is usually placed at the end of the bottom cone, although it may be at any convenient point between the bottom cone and the differential motion. The object of this gear is to give the correct initial speed to the bobbin at the beginning of a new set of bobbins, i. e., when the first layer is being wound on the empty bobbins. It will be noticed that the tension gear comes into operation after the first layer has been wound, and has practically no influence whatever on the speed of the bobbin during the winding of the first layer; because the cone belt has been set into position at the smallest working diameter of the bottom cone, where it remains during the first traverse of the carriage or bobbin rail. Then after the first change of the builder the tension gear regulates the distance moved by the cone belt so that from the second layer on the bobbin to the last layer, the bobbin speed is regulated through tension gear and cone belt.

COST-FINDING IN MILLS.

BY PAUL STANSFIELD.

The science of mill costs means simply good bookkeeping in order to have a proper knowledge of how much or how little gain is made out of the mill business. It is doubtful if there is any other important business where there is so much guess-work as there is in the textile business of today. Many mills have no accurate system of cost finding at all. They simply take stock semi-annually, balance the books, and if they have received more than they have paid out, their guess was a good one and everything is well. Many times, however, after taking stock and balancing the books the result is a large loss to the mill, and, of course, to the stock-holders. Now that competition in the cloth market is getting keener every day, I think manufacturers are beginning to pay more attention to the actual cost of manufacturing, and are getting up systems that will not only keep them fully informed as to the actual margin between the manufacturing price and the selling price of a yard of cloth, but that will also tell them at a glance the cost per yard in every process.

During the past few months I have questioned many prominent mill managers as to their system of ascertaining costs, and have been surprised to find a diversity of opinion as to the value of keping detailed costs of every department, or, in fact, of keeping costs at all. Each man admitted that he gave an occasional thought to the subject, and that

some sort of system was in vogue in his office, but the general answer was that the system was far from being satisfactory in its results, and he did not care to say that the figures obtained by it were safe from criticism. It seemed to be the general opinion that no system could be devised that would give a cost anywhere near what it really was, owing to the numerous processes through which the cotton had to pass before it reached the packing room; and it is this doubt as to accuracy that makes some men care very little whether the costs are figured or not.

To the average business man, however, a knowledge of cost of production, or actual necessary expenses that must be incurred, has always seemed of the utmost importance, and yet I have heard of managers of large factories that seldom think of a cost sheet, merely relying on their overseers to run their rooms as cheaply as possible, and on the selling agents to dispose of the product at the highest market rate. Such a man will argue that so much attention to detail is bound to prove more expensive to the mill than it is worth, by reason of the increased help that would be necessary all along the line to furnish the reports, and that, in addition, an extra hand would be needed in the office to check up the data, and compile the figures in such a manner as to be readily understood by selling agents or mill officials, some of whom are not familiar with the details of the business. He will tell you, also, that such close figuring is a waste of time, energy, and money, as, given the average count of the yarn or yards per pound of a cloth, he can rapidly compute the probable cost without making a dozen figures, and will add with a wise look that his experience will tell him he cannot be very far wrong. Imagine anybody being able to take a piece of gingham, containing three or four colors and cord effects, and say in a minute's time what it would cost to make it!

On the other hand, a manager that believes in the figuring of costs in detail, even to a thousandth of a cent in each process, will tell you that he doesn't see how a mill can keep going unless it knows very nearly the exact cost of every yard of cloth it manufactures. One man, whose system of costs I had the pleasure of examining and found to be a very good one, showed me how he could tell, at an instant's notice, the exact cost per yard in every department of any kind of goods he made. He said that by his method of tests at the end of a year's business he had satisfied himself and his directors that the figures on his cost sheet were not far out of the way. The same man told me of a certain cotton mill manager, in the habit of calculating his costs after the manner of the man first referred to, who would name a price on a call for cloth that other men knew was away below the actual manufacturing cost of the goods. Of course, that man's mill generally got the contracts, to the disgust of the competing mills, but, as might be expected, it was always a source of wonder to the stockholders that the mill should always be rushed with orders, and the end of a seemingly busy year show such a large amount on the wrong side of the balance sheet.

To some mill managers, the idea of keeping detailed costs, especially to the extent of that of each yard of cloth in every department, in mills making a hundred or more different kinds of goods, seems a stupendous undertaking, and yet if one takes the trouble to investigate he will find that about every overseer has a private book in the inside pocket of his vest in which he keeps all the figures necessary for his own information. Now, if an overseer thinks it worth while to go to this trouble, why should not a manager think this attention to detailed costs worth while, also? The fact that overseers are in the habit of working out their own costs, and could furnish all the data to the office without much extra effort, does away with the idea that an extra hand all round would be necessary.

This reduces the expense of the whole detailed statement to the point of having an extra clerk in the office. Of course, after a system was well established, this clerk would have ample time to assist in other office work, reducing the expense of keeping costs still more, but it would impair the clerk's efficiency if he were subjected to frequent interruptions at a time when his whole mind was concentrated on working out his costs. Such interruptions, with the resulting errors, might diminish the clerk's interest in the

work, and lead to a dissatisfaction that would question the wisdom of having the detailed work done at all.

One well-known man in Maine mill circles, informed me that he used his system of cost-finding as a guide to judge the worth of his overseers. He explained that as he had to do with four different mills, he could very easily compare the general expense cost per yard or pound in each of the four carding, spinning, dressing and weaving rooms, and said it was astonishing to note the difference between overseers in the number of "non-producing" hands employed for the same amount of stock put through the machines.

Now, having said so much in the way of introduction, I shall try to show how easily these detailed costs can be obtained. There will be a certain amount of expense before the cotton is delivered to the pickers by the yard hands, but this can be attended to later on when the grand general expense account is being made out. All that has to be done is to divide the amount of pay-roll by pounds of cotton handled, as follows:

$525 (wages paid) ÷ 350,000 (pounds picked) = 15 cents per pound for picking.

As to the card room, the plan is much the same, except that more care is needed in looking after the data, owing to the fact that the cost of each hank roving must be kept separate. The necessary results can be obtained without much extra effort on the part of the overseer, and without extra expense. For example, we will take a card room that furnishes roving for a mill spinning a dozen or more different numbers of yarn, varying in size from 30s to 100s. As it will not be necessary to work out in detail the roving cost of each number of yarn, I will illustrate with 30s and assume that it is made from 6-hank roving.

It has been my experience that it is much easier to gather all the costs up to and including slubbers into one statement, this being feasible because up to that point the cotton receives the same treatment regardless of the number of yarn it is desired to make of it. But sometimes it is convenient to know the different costs which make up this total of "up to and including slubbers." For this purpose it is better to divide the pay-roll in groups, something after this style:

Overseer and second hands,
Card tenders,
Strippers, grinders,
Roving hands, etc.,
Drawing,
Slubber tenders,
Intermediate tenders,
Jack frame tenders,
Doffers,
Elevator men,
Scrubs.

By keeping the pay-roll divided in this manner it will be readily seen that the cost of each process can be obtained very easily, but for ordinary purposes it is necessary only to get at the "up to and including slubbers" cost by drawing off the items from the pay-roll, as follows:

Overseer and second hands	$60.00
Card tenders	650.00
Strippers, grinders	150.00
Roving hands, etc.	246.00
Drawing	400.00
Slubber tenders	400.00
Doffers	150.00
Elevator men	20.00
Scrubs	24.00
Total	$2,100.00

Now by these figures it has cost $2,100.00 to get the 350,000 pounds through the slubbers, so we simply do a little figuring thus:

$2,100.00÷350,000=60 cents total card room cost "up to slubbers, included." To this add 15 cents for picking, giving 75 cents total cost, up to the slubbers inclusive.

Having got the cost per pound so far, we come to the cost of the roving. The many different sizes make it necessary to use a little more care. Continuing our example with 6-hank roving, we must take into account the intermediate cost of, say, 2-hank, so we shall have to refer to the pay-roll, after noting the different prices paid per hank, and draw off the total number of hanks of each kind, and the wages paid. For instance, we may get

On 2-hank, 150 hanks at 9c.	$13.50
and on 6-hank, 400 hanks at 18c.	72.00
which gives wages paid as	$85.50

As we are bringing our figures to a cost per pound basis, and not cost per hank, we shall have to get these hanks into pounds, which can be done by making very few figures, as follows, working out the 2-hank as an example:

150 (hanks by clock) × 136 (spindles per frame) =	20,400 hanks
20,400 (hanks) ÷ 2 (hanks per lb.) =	10,200 lbs.
6-hank roving (calculated in same way)	9,066 lbs.
Total	19,266 lbs.

$85.50 ÷ 19,266 (lbs.) = $ .45 cost of fine frames per lb.
Cost up to slubs . .75

Cost of 6-hank roving $1.20

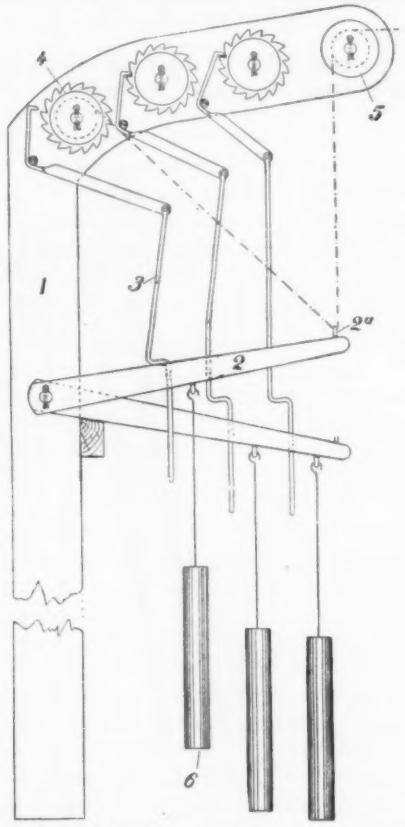
To ascertain the individual costs with extreme accuracy, the wages of the overseer, second hands, doffers, elevator men and scrubs would have to be divided in proportion to the time each hand had to spend in each process, and the pounds produced should also be reduced a certain percentage for waste; but for the purpose of computing the cost of each yard or pound of cloth, the foregoing method gives the necessary accuracy.

So much for the picking and carding departments. At another time I may go on with the other departments of the mill, but I think enough has been said to show that this matter of detailed costs is not as complicated as it seems at first thought, and that the expense connected with their preparation need not be very great.

A NEW WARP LET-OFF MOTION.

The accompanying illustration shows a let-off motion for warp threads that are under a different tension from the rest of the warp, and therefore require a special let-off motion that the proper amount of yarn may be delivered. It delivers a uniform length of yarn from the beginning to the end of the piece with absolutely no variation in the tension. The yarn is not held directly by hook weights, which in most cases are the cause of bad weaving. It often happens that with the old-style of weights the weaver, without the knowledge of the overseer, reduces either the friction, or the weight itself, in order to stop the yarn from breaking. Again the strings may become tangled causing a disarrangement of the friction or they may be rough and uneven and reel irregularly on the spool.

By the new device all these defects are eliminated.' The spool on which the yarn is wound is provided with a ratchet wheel, 4.



The thread is drawn from the spool and passes through the eye, 2a, in the lever, 2, over the guide roll, 5. Fastened to the lever, 2, is a rod and hook, 3, the latter connected with a ratchet. If for any reason the tension of the thread is reduced, the weight, 6, pulls down the lever, 2, and by means of the rod and hook, 3, turns the spool backward and takes up the slack in the yarn. If, on the other hand, the tension on the thread is increased, the lever, 2, is raised, releasing the ratchet and allowing the yarn to unwind till the tension on the yarn is reduced, when the lever falls to its normal position and the hook again connects with the ratchet. When the proper position is found the weight is

fastened to the lever and the weight pinned back so the weaver cannot remove it. The tension is then kept the same throughout the whole piece.—Mittheilungen fuer Textil-Industrie.

A RING SPINNING MACHINE WITH VIBRATING ROLLS.

In the ring spinning machine shown in the accompanying illustration the rolls are made to vibrate so as to draw the yarn as it is drawn on the mule, except that the rolls are moved, instead of a carriage carrying the spindles. The roving is drawn by the rolls and then twisted as it comes from the rolls and passes to the spindles. When the rolls move upward the yarn is drawn and spun, and when they move downward the yarn is wound on the bobbins. The rolls revolve far enough when rising to deliver a suitable length of roving. When the rolls move downward they deliver only short lengths of roving corresponding to that delivered by the mule when the carriage goes in.

In order to obtain a uniform tension on the yarn the machines are so adjusted that the traveler ring is held stationary opposite the largest diameter of the bobbin during the process of drawing and spinning, when the rolls are moving upward. To effect this the spindle is provided with a movable sleeve and a device for holding the ring traveler in position. When the winding process begins the ring is again vibrated so that the yarn may be properly wound on the bobbin.

Fig. 1 is a side view of the machine. Figs.

FIG. 2.

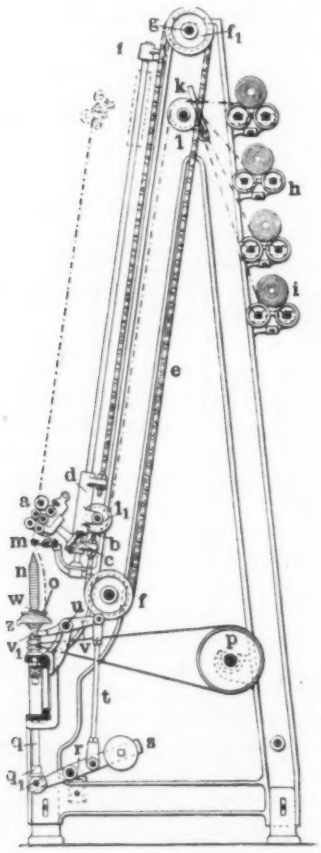


FIG. 1.

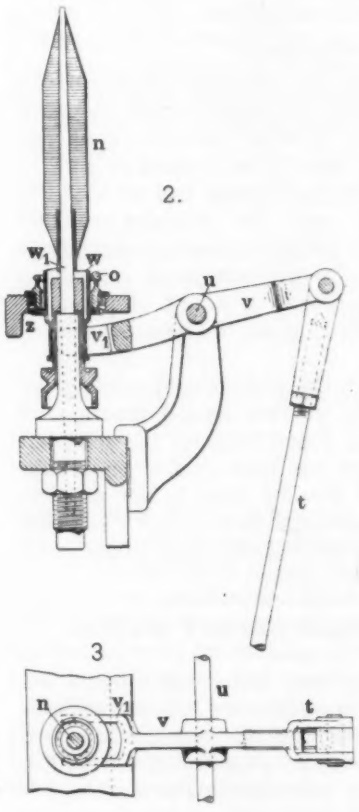
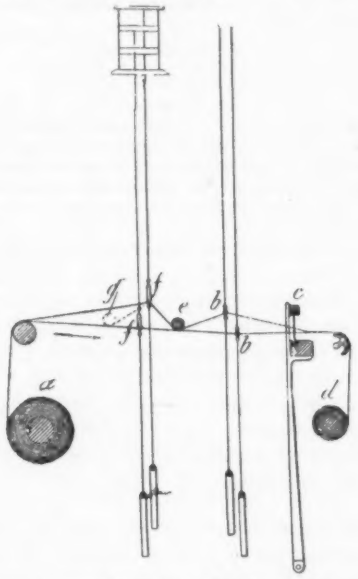


FIG. 3.

2 and 3 are detailed plans on a larger scale. The drawing rolls, a, are supported on the carriage, b, which is drawn back and forth by the chain, e. The chain pulley is fastened to the shaft, g, which runs along the whole length of the machine and is driven in any desired manner. The roving is drawn from the spools shown at the back of the machine, and passes over the carrier rolls, 1 1′, to the drawing rolls, a. After the yarn has been drawn to the required fineness it is delivered to the drawing rolls, twisted by the spindle and then wound in the usual manner on the bobbin. The ring rail is vibrated only during the delivery and winding of the yarn.

MOIRE EFFECTS ON THE LOOM.

The device to be described is designed for the production of moire effects; independently of their form and arrangement, the figures are shaded at the edges. These effects



are usually produced in the loom by subjecting a part of the threads at intervals to a greater tension than usual, then releasing the strain and allowing the threads to resume their normal position. As the cloth continues to be woven independently of this strain it follows that light and dark shades will be produced by the alternate tension and slack of the threads.

The new device is shown in the accompanying illustration in which the different parts are indicated as follows: Warp beam, a; heddle, b; loom lay, c; cloth beam, d. Between the heddles and the warp beam is a rod, e, which extends across the loom. Behind this rod are extra heddles, f, which are operated by a jacquard motion. The tension of the warp threads is obtained by an alternating raising and lowering of the extra heddles, f. Another rod, g, is placed back of the heddles and serves the same purpose as the rod, e, but for a separate set of threads. The rods, e and g, are adjustable so that the tension can be regulated as desired. In this way a strain is brought on the warp threads which produces the moire pattern.—Leipziger Monatschrift fuer Textil-Industrie.

FLANNELETTE.

The numerous distressing accidents caused by flannelette clothing catching fire have led to efforts in England to render the material fireproof. Various salts are applied to the cloth during the finishing process. Some have the property of volatilizing at high temperatures and thus retarding the progress of combustion. Among these are the sulphate and chloride of ammonia. The disagreeable odor of the ammonia and the fact that the salt is completely removed by washing prevents the general use of these two materials.

Other salts have the property of melting at high temperatures, coating the fabric and thus obstructing combustion. These include water glass, borax and phosphate of soda. Water glass makes the fabric boardy and, consequently, is usually mixed with glucose. Still another class of materials used in solutions for fireproofing flannelette such as tungsten, vanadium, and molybdenum penetrate the cloth and solidify on the fibre. Tungsten is used the most because of its lowest cost.

While the use of these fireproofing solutions undoubtedly decreases the danger in wearing flannelette, objections are raised to them that they have an injurious effect on the health of the wearer, and that under the most favorable conditions their fire-resisting quality is greatly reduced by washing and wearing the goods.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Numbering Braided Banding.

Editor Textile World Record:

How is braided banding numbered and how can the number of any one piece of banding be determined? Braid (604).

Braided banding is made with sixteen strands. Single No. 10 cotton yarn is taken as a standard and the number of the banding changes with the change in the number of threads in each strand. Two strands of 20s cotton yarn may be used in place of each strand of 10s, but in both cases the number of the banding is the same. The following table gives the numbers of the banding and the yarn used in each of the sixteen strands:

No. of banding.	Each strand.
30	2/10 or 4/20
48	3/10 or 6/20
64	4/10 or 8/20
80	5/10 or 10/20
96	6/10 or 12/20
112	7/10 or 14/20
128	8/10 or 16/20

Intermediate sizes are made by adding one thread of 20s; thus, No. 40 banding is made with 5/20 in each of the sixteen strands of which the braid is composed.

Deodorizing Wool Scouring Liquor.

Editor Textile World Record:

Please advise us where we can find a deodorizing process for wool scouring liquor and the best known process for regaining the grease.

Westwood (609.)

Our special correspondent in England, to whom this question was referred, writes as follows: "I don't think I need add anything to the explanation given in my last instalment of notes so far as regaining is concerned. The 'cracking' of the liquor with sulphuric acid is practically universal. But as to the deodorizing or bleaching the oil that is squeezed from the crude magma, I can give you one hint. Try the experiment of a 5 per cent. or so solution of bichromate of potash in hot water, slightly acidulated with sulphuric acid. The oil and water need agitating all the while so that the liberated oxygen can do its work in clearing the oil. Permanganate of potash can be used, but is not considered as good as the bichromate. This recipe is so simple that it may perhaps not be improved on."

Weight per Yard from Small Sample.

Editor Textile World Record:

Since completing a course in a textile school about eighteen months ago I have been working in the office of a jean mill. The product of the mill is now being changed from jeans to cotton worsteds. I have been promoted to the position of designer and have frequent occasion to analyze cotton worsted fabrics made in eastern mills. I would like to know the best way of finding the weight per yard from a small sample. When in school I received instruction in the work by both the metric and English systems, the following examples illustrating the respective methods:

1. Ex. A square inch of a worsted cloth weighs 2 1/2 grains. Find weight per yard 56 inches wide.
56 (in. wide) × 36 (in. per yard) × 2 1/2 (grains) ÷ 437.5 (grains per oz.) = 11 1/2 ounces per yard, 56 inches wide.

2. Ex. A square decimeter of a worsted cloth weighs 1 1/2 grammes. Find weight per yard 14 decimeters wide.
14 (dec. wide) × 10 (dec. per meter) × 1 1/2 grammes) = 210 grammes per meter 14 decimeters wide.

Is there not a simpler way of calculating by the English system than the one given above? I find the second method wholly impracticable. We never get samples large enough (16 square inches) for the metric method; the widths of our goods cannot be expressed in decimeters; and in addition to these difficulties the results obtained are expressed in units different from and incommensurable with those in use. Gera (608).

To obtain the necessary degree of accuracy in calculating the weight per yard from a small sample, it is necessary to weigh a sample larger than a square inch. For most fabrics an area of, say, 4 square inches is sufficient. Any material increase above this size, say, to 16 square inches, is not only unnecessary, but generally impracticable because of the size of the samples available. The metric example has evidently been formulated to illustrate school theory rather than mill practice.

The best practice consists in selecting an area of (4.32 square inches), 1/300 sq. yd. This area can be obtained by making the samples 1.8 by 2.4 or 1.2 by 3.6 inches. Every grain in the weight of a sample of that area corresponds to one ounce per yard, 52 1/2 inches wide. If the sample (1/300 sq. yd.) weighs, say, 8 grains, the cloth weighs 8 ounces per yard 52 1/2 inches wide. The weight per yard for any width is found by simple proportion from the weight of 52 1/2 inch goods. Thus for 40-inch goods:

40 (inches) × 8 (ounces) ÷ 52 1/2 (inches) = 6 1/10 ounces per yard, 40 inches wide.

If the yards per pound are to be found the process is equally simple. Assuming as before that the sample (1/300 sq. yd.) weighs 8 grains, the calculation of yards per pound is as follows:

52 1/2 (in. wide) × 8 (gr.) = 420.
840 (grains) ÷ 420 = 2 yds. per pound, or 8 ozs. per yd. as already found.

Here the 52 1/2 × 8 gives the weight in grains of 4.32 square inches, or 12/100 of a running yard 52 1/2 inches wide; the 840 grains is 12/100 of a pound; consequently the division of the latter by the former gives the running yards per pound. The 840 grains can be easily remembered because of the correspondence with the cotton base, 840 yards.

The yards per pound for any other width than 52 1/2 inches are found in the same way. Thus for 40-inch goods:

840 (grains) ÷ 320 (40 in. × 8 gr.) = 2 5/8 yards (40 in. wide) per pound.

The area of 4.32 square inches is chosen because it enables the cotton count to be found by dividing the thread per inch by the weight in grains.

Size of Ring Travelers.

Editor Textile World Record:

If a twister is changed from two to three or four-ply yarn, how is the weight of the traveler for the new work calculated? How is the weight of the traveler calculated when the count is changed?

Aberdeen (596).

The weights of the travelers required for yarns of different ply or count are approximately in proportion to the size of the yarn, irrespective of the ply. By the fixed weight system of numbering yarn the number (count) indicating the size grows larger as the yarn grows finer, and consequently the rule for calculating the weight of the traveler is as follows: The weights of the travelers required for yarns of different sizes or ply are approximately in inverse proportion to the fixed weight counts.

Ex. A 2/30 (No. 15) yarn is twisted with an 8-grain traveler. Find number of traveler for 3/30 (No. 10) yarn.

10 : 15 :: 8 : weight of required traveler.

(15 × 8) ÷ 10 = 12 grains, weight of traveler required.

This rule applies to spinning as well as twisting frames.

Festus.

When changing the counts on a spinning frame and the twist standard is to remain the same, that is, if we change from, say, 40 warp to 20 warp, the following rule will give approximately the travelers to be used for the required counts.

Rule: Take the weight of 10 travelers being used, multiply by the counts being spun, and divide result by counts required. This will give weight of 10 travelers to be used.

Ex.—If we are spinning warp yarn of 40s counts, and using a 13/0 Wilson round pointed traveler, what traveler will be needed for a 20s warp?

There are 10 travelers in 3 1/2 grains, then 3 1/2 × 40 ÷ 20 = 7 grains, the weight of 10 travelers to be used, and will be found to equal a 5/0 traveler of same style.

The reason 10 travelers are taken is that the tables issued by the various companies making travelers usually give the weight of 10. Again a more accurate calculation is made than by taking only one traveler on account of striking a better average.

In changing from one make of traveler to another the same rule can be applied; for instance, in the previous example a weight of 7 grains was obtained; this would give a 5/0 Wilson round pointed traveler, a 4/0 National square pointed, or a 2/0 Hicks.

It must be remembered that twist, speed and style of traveler may necessitate a weight slightly different from that given by calculation; however, the method above is as practical and simple as any.

The weight of a smaller number of travelers may be used on twisters for computing the required size, if desired.

The following table will give a comparison between the weights and numbers of several makes of ring travelers:

Weight of 10 Travelers in Grains	De Haven	Wilson	F. W. & Co.	National	Slater	Shaw	American	Chase	P. L. & Co.	Hicks
1	23-0	23-0	23-0	25-0	25-0	25-0	25-0	25-0	25-0	30-0
1¼	22-0	22-0	22-0	24-0	24-0	24-0	24-0	24-0	24-0	19-0
1⅝	21-0	21-0	21-0	23-0	23-0	23-0	23-0	23-0	23-0	18-0
1¾	20-0	20-0	20-0	22-0	22-0	22-0	22-0	22-0	22-0	17-0
2	19-0	19-0	19-0	21-0	21-0	21-0	21-0	21-0	21-0	16-0
2¼	18-0	18-0	18-0	20-0	20-0	20-0	20-0	20-0	20-0	15-0
2½	17-0	17-0	17-0	19-0	19-0	19-0	19-0	19-0	19-0	14-0
2⅝	16-0	16-0	16-0	18-0	18-0	18-0	18-0	18-0	18-0	13-0
3	15-0	15-0	15-0	17-0	17-0	17-0	17-0	17-0	17-0	12-0
3¼	14-0	14-0	14-0	16-0	16-0	16-0	16-0	16-0	16-0	11-0
3½	13-0	13-0	13-0	15-0	15-0	15-0	15-0	15-0	15-0	10-0
3¾	12-0	12-0	12-0	14-0	14-0	14-0	14-0	14-0	14-0	9-0
4	11-0	11-0	11-0	13-0	13-0	13-0	13-0	13-0	13-0	8-0
4¼	10¾-0	10½-0	10½-0	12-0	12-0	12-0	12-0	12-0	12-0	7-0
4½	10-0	10-0	10-0	11-0	11-0	11-0	11-0	11-0	11-0	6-0
4¾	9½-0	9½-0	9½-0	10-0	10-0	10-0	10-0	10-0	10-0	5½-0
5	9-0	9-0	9-0	9-0	9-0	9-0	9-0	9-0	9-0	5-0
5¼	8½-0	8½-0	8½-0	8-0	8-0	8-0	8-0	8-0	8½-0	4½-0
5½	8-0	8-0	8-0	7-0	7-0	7-0	7-0	7-0	8-0	4-0
5¾	7½-0	7½-0	7½-0	6½-0	6½-0	6½-0	6½-0	6½-0	7½-0	3½-0
6	7-0	7-0	7-0	6-0	6-0	6-0	6-0	6-0	7-0	3-0
6½	6-0	6-0	6-0	5-0	5-0	5-0	5-0	5-0	6-0	2½-0
7	5-0	5-0	5-0	4-0	4-0	4-0	4-0	4-0	5-0	2-0
7½	4-0	4-0	4-0	3-0	3-0	3-0	3-0	3-0	4-0	1½-0
8	3-0	3-0	3-0	2-0	2-0	2-0	2-0	2-0	3-0	1-0
8½	2-0	2-0	2-0	1½-0	1½-0	1½-0	1½-0	1½-0	2-0	½-0
9	1-0	1-0	1-0	1-0	1-0	1-0	1 0	1-0	1-0	1
10	1	1	1	1	1	1	1	1	1	1½

F. W. & Co., Fisher-White & Co.; P. L. & Co., Pierce-Lewis & Co.

J. T. B.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.

KNIT GOODS SITUATION.

As far as the knit underwear end is concerned, the market is in a fairly well sold-up condition. The majority of the manufacturers are on what is called "easy street" and scarcely any of them show any great anxiety for orders for 1906. About the only exceptions to this are those manufacturers making ladies' low priced ribbed goods. The indications are that they have not booked anything like the quantity of these goods that they generally do at this time of the year. The cause of this is the apparently heavy advances being asked, in consequence of which a great many buyers are holding off awaiting developments, and a number of them will not buy their usual quantity until their January visits to the market. They are hoping to be able to buy a garment, weighing more than six pounds, that they can place in the 25-cent grade, although it is a difficult matter to see how this can be done, even if the price of cotton should decline during the coming month.

In the month of November all the prominent New York State manufacturers of this class of goods met and formed a gentlemen's agreement to sell six-pound goods at $2.00; seven-pound at $2.20; eight-pound at $2.40; extra sizes weighing seven pounds at $2.25 and extra sizes weighing eight pounds at $2.45, and it was stipulated in the agreement that these goods should be made of the ordinary carded yarn, using edging not to exceed 80 cents per gross, ten-ligne mercerized tape, mercerized shell buttons costing not to exceed 12 cents per gross, and the scale of sizes to be half as many size 4 as 5 and 6. The goods to be sold F. O. B. the mill, and no countermands to be accepted. Up to date we have not learned of any break in this agreement and although these manufacturers are all open for business, they seem to have the situation well in hand and buyers that want cheaper goods must either buy Southern production or goods made in Pennsylvania mills.

The Chickamauga Knitting Co. are showing through Condit & Arnold a line of six-pound ordinary size goods at $1.90 and seven-pound extra size at $2.17 1/2, and it is said that they have taken considerable business on this basis.

The Newville Knitting Co. of Newville, Pa., have sold up their production to their regular trade on the basis of $2.12 1/2 for seven-pound goods.

New York State manufacturers are asking ten cents per dozen advance for bleached goods, which has had the effect of curtailing the purchases considerably and it begins to look as though a 25-cent bleached garment would not be generally used this coming season.

It is contended by many that this season will witness the changing of some retailers' ideas on prices at which ladies' ribbed goods will be sold; and that, owing to the fact that six-pound garments are not satisfactory to the consumer, the seven and eight-pound goods will be sold at 30 cents or 35 cents a garment. From all reports obtainable, however, a large proportion of the business is being placed on the six-pound garment which would indicate that 25 cents will be the popular price, regardless of the weight.

Another of the stipulations in the gentlemen's agreement referred to above is that there shall be no change in the prices until November first next, which, if carried out will prevent a repetition of the occurrence of two years ago, when a number of buyers found themselves with large stocks of six-pound goods in the month of August, when their competitors were able to buy seven-pound goods at the same price.

Some buyers appear to be of the opinion that manufacturers are endeavoring to get an unwarranted profit on this class of goods this season, but when it is taken into account

that the yarns that go into these goods are about six cents a pound higher than last year and that to make a seven-pound garment requires from 7 1/2 to 8 pounds of stock, the apparently heavy advance is accounted for, and it is difficult to see how any lower prices could possibly be made, even if there were no so-called combination.

One effect of the price agitation of the 25-cent ribbed line has been the marked increase in sales of the better lines and several manufacturers of the 50-cent grades have withdrawn their samples entirely from sale, claiming to be sold up for the season. Among these are the Avalon Knitwear Co., La Tosca Knitting Co., Campbell Knitting Co. and J. H. Murphy Knitting Co. The trade done on these lines has been principally on the fine stitch combed peeler goods at $3.62 1/2 to $3.75 and buyers have selected the simple, neat trimmings.

Since our last writing the men's fleeced business has been opened and as far as the number of manufacturers are concerned, is practically closed. For a few days after the government report came out some fairly good fleece lined goods were to be had at $3.50, and one New York State manufacturer showed a very creditable garment at $3.37 1/2, but this was soon advanced to $3.50 and the $3.50 lines to $3.62 1/2 and then withdrawn. Early in the month the Oneita Knitting Co., Utica Knitting Co., Robert MacKinnon & Co., and John Stewart Co. were reported as being sold up for the season.

The Union Mills started their prices as follows: Harder Branch garment which last year sold at $3.25, they opened at $3.70; the Sagamore at $3.85; and the Union with special trimming at $3.95. These prices have since been advanced ten cents per dozen.

The plush back line of ribbed goods sold under the trade names of Regal and Vellastic also come in for their share of attention while speaking of advanced prices. Their children's lines are open at $1.25 less 20 per cent. and were advanced to $1.25 less 15 per cent. The ladies' goods opened at $3.62 1/2 and were advanced to $3.67 1/2. The business on this class of goods has increased considerably of late and both companies making them have been obliged to increase their capacity during the past year. Flat wool goods are rapidly approaching the sold up condition and the manufacturer's admonition to buyers is "to hurry up and get in."

Owing to the extreme advance in the price of wools, it is a difficult matter to find scarlet goods to retail at $1.00 as in former years, and while some manufacturers have usually made these at from $7.50 to $8.50, the lowest priced garments shown now are those at $9.00 to $9.50.

A fact worthy of note in the underwear business today is the increasing demand for combination suits for men, women and children. In ladies' goods the garment to retail at 50 cents is quite popular, and for this price may be had a tuck stitch carded peeler garment, weighing about 10 pounds to the dozen. Next comes the fine stitch peeler and white to retail at $1.00, made of combed yarn and with light brushing; then the tuck stitch worsted to retail at $1.50 and the fine stitch worsted to retail at $2.00. These are nearly all taken in the five button opening down the front. In children's suits the most popular lines are the fine ribbed peeler garments to retail at 50 cents, and for boys the heavy plush back silver grey at the same price, and for $1.00 and $1.50 garments some very sightly fine stitch worsted goods are being shown. In men's suits the heavy end of the business is done on the silver and ecru cotton ribbed garments at $1.00 and on worsted plaited tuck stitch garments at $1.50. Some very handsome effects are being shown in fancy tinted worsted mixtures at from $3.00 to $5.00 and some robin's egg blue and fancy randoms in silk mixtures at $5.00 to $10.00 a suit.

HOSIERY.

It is no more a buyer's market in the hosiery end of the knit fabric business than it is in the underwear. The manufacturers have the situation well in hand and as a rule are getting from 5 to 10 per cent. advance on all fleeced and heavy cotton numbers, with the effect that buyers are changing their standard of weight for this class of goods from 2 1/2 to 2 1/4 pounds in order

to have the lines at the popular prices. Hem top, 176-needle fleeces, weighing 1 pound, 14 ounces, sold last season at 77 1/2 cents, and are now being held at $1.85. Two-pound 4-ounce goods that sold last season at 90 cents, are now being sold at 97 1/2 cents to $1.00, and 2-pound 8-ounce goods have gone from 97 1/2 cents to $1.05, and 2-pound 12-ounce goods from $1.00 to $1.10, with rib top from 7 1/2 cents to 10 cents higher. Lower quotations are, of course, made, and it is quite sure that one line of 2 1/2-pound hem top goods were sold as low as 92 1/2 cents for some unaccountable reason.

It is now said that three of the leading makers of ladies' fleeced goods had sold up their entire production without their salesmen going west this season, and a very active demand is being felt by all manufacturers of this class of merchandise. Yarns are being held nearly as high now as during the Sully boom and further advances are quite likely to be made shortly.

Additional advances of 2 1/2 cents per dozen are being asked on men's half hose at from 75 cents to $1.00, and those goods mentioned in our last issue as being made from cotton yarn spun on wool machinery have also been advanced 2 1/2 cents to 5 cents per dozen. Wool goods have also shown quite an advance.

Predictions are made that when the market becomes cleared up some on fall lines there will be considerable call for duplicates on spring lines, and that this is sure to lead to still further advances, as the available supply was never more limited than now.

The outlook is for a very active demand for ladies' fashioned black goods at 25 cents to 50 cents and for fine gauge laces and embroidered goods. As the foreign market is well sold up, as well as the home manufacturers, it is difficult to see where the goods will come from.

In higher priced goods, whites are having a large call in both ladies' and children's lines. Tans are slower than last season. Black hose with the small figure and vertical stripes on black and colored grounds are growing in popularity. Lace striped half hose are also gaining ground and two toned plaited goods are being selected freely.

EFFICIENCY OF KNITTING MACHINES.

Last month we outlined a method of calculation for determining the efficiency of knitting machines and accompanied it with a request for suggestions and criticisms with a view of obtaining a thoroughly reliable and simple method of determining whether knitting machinery is being operated at its highest efficiency or not. Following are the suggestions so far received:

In our opinion the best and most practical way to determine the efficiency of knitting machines is to attach an indicator on each head or machine cylinder that will register the number of revolutions the machine makes. If there is a loss of revolutions from any cause, the daily record, easily taken, of the individual machine is easily traced and remedied. By this method practical results could be obtained without a complicated calculation. Mecklenburg.

I would suggest, if the present form is retained for the table, that the shorest length per revolution be one-quarter yard, and the longest, seven yards. The latter length would cover the diameter of the largest cylinder used. Richland.

Regarding your very commendable efforts to perfect a system of calculating the production of knitting machinery I would suggest that the calculations be based on the length of the cotton skein of 840 yards, which forms the basis of the most widely used system of numbering yarn. I would further suggest that the equivalents of the cotton number be given in the run system and in the grains per 100 yards. The worsted number need not be included as it can be easily calculated from the cotton number, being just one-half more. The grains for 20, 25, 50 and 120 yards can be easily found from the grains per 100 yards by a mental calculation.

Aiken.

I think the table based on the length of the yarn per revolution is better than if based on the length of the yarn per minute. To calculate the length of yarn per minute it would be necessary for the knitter to do a lot of figuring before using the table. It is my experience that this would be a reason

for preventing the majority of them from using the system, which in its general form I consider very good. Paulding.

I think the table should give the total pounds of the theoretical production in one feed for a given number of hours, and also for the given number of revolutions, also for single feed machines, for two feeds, three feeds, four feeds, and so on up to twelve feeds. This would necessitate compiling a number of different tables, probably enough to fill a small book, but the book would be of great value to knitters generally.

Putnam.

I think the table would be better if based, as you suggest, on the length of yarn per minute, as then it would be applicable to all kinds of machines whether flat or round regardless of the size of the cylinder. Variations of one-eighth of a yard on which the original table is based would be excessive for small cylinder machines, whereas with the speed per minute method the same degree of accuracy would be obtained for all machines. Monroe.

Separate tables should be compiled to cover different working schedules, such as 40, 48, 50, 55 and 66 hours per week. In New York State the mills run 60 hours per week, but in other sections both longer and shorter schedules are in force.

Winston.

I think the table as you have compiled it will answer the purpose very well, but am very positive it could be improved by putting the cotton number at the top of the table and placing the equivalents by the other systems of numbering below. Dickson.

The general plan that you have outlined is all right, but the table is not suited for the small cylinders of our hosiery machines. I think your suggestion to base the table on the speed per minute would be better for hosiery. Warren.

A table to show the theoretical production in pounds for a given number of revolutions per minute and for a given number of feeds would be of the greatest value. By referring to the table under the size of the yarn, the theoretical production in pounds for a given number of revolutions per minute and feeds should be found. The machines running 50 revolutions per minute and four feeds would be equal to 200 revolutions per minute, so in reality the table should be based on a single feed, and of a scope wide enough to include the highest number of feeds generally used on knitting machines.

Clinton.

I do not think the inch column is necessary; the yard is all that is required, especially if the speed is given at so much yarn per minute. Carroll.

I hope you will work out the tables for calculating the production of knitting machines, as the plan seems to me to possess great merit. I would suggest that the size of the yarn by the 840-yard cotton system be graduated by single points up to 10, and by two points up to 40, after which the sizes could be indicated at intervals of four or even more points. Durham.

CHANGING NEEDLE CYLINDERS.

This machine, recently patented in the United States, is designed to facilitate the change of needle cylinders and to provide simple means for reversing the ribbers. Fig. 1 is a side elevation; Fig. 2, a cross section at the needle-cylinder, ribber and working parts; Fig. 3, an enlarged plan of Fig. 2, with the cylinder and ribber removed; Figs. 4, 5, 6, 7, and 8 part of the cylinder frame and mechanism for bringing the needles into operative and inoperative position.

In operation when all the needles are to be used the pawls and the cam are in the position shown in Fig. 5. The needles which are being moved upward in the channel out of the race will raise or lift the bridge into the position shown in dotted lines in Fig. 5 and then travel upon the top surface of the flange to and into the ordinary cam-race, as will be manifest. When it is desired to drop, say, every third needle, the bridge is raised by hand by means of the pin into the position shown in Fig. 4. The needle will drop on to the guide-surface of the recess. The pin is

then released and by the spiral spring action returns to its normal position, carrying down with it the bridge, which again closes the re-

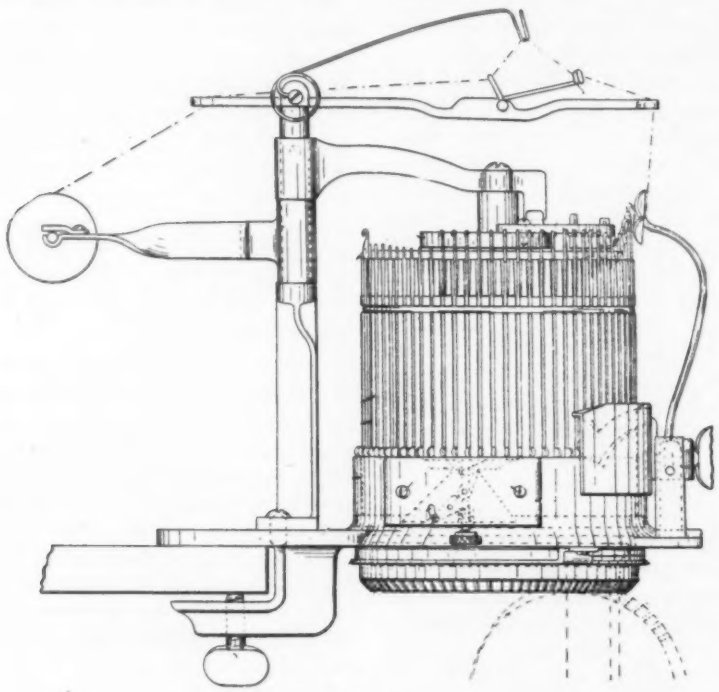


FIG. 1

cess, and the next following two needles will slide over the bridge into the cam-race. During this movement the needle has reached

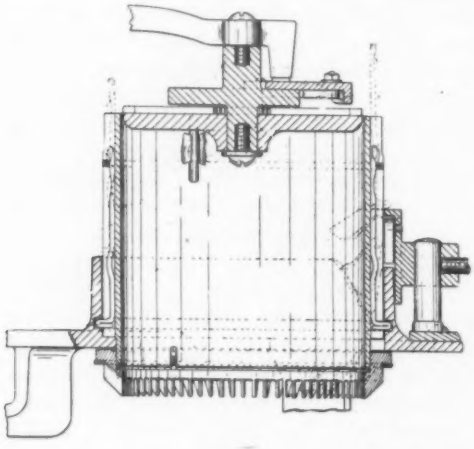


FIG. 2.

a position where it bears against the cam and in its further movement again raises the said cam and the bridge and allows the third needle to drop on the guide-surface. Meanwhile the first needle has cleared the cam and is moved with its shank through the channel into the race the bridge plate again returning to its normal position. This operation repeats itself with every third needle, as will be manifest, but of course it is well understood that by changing the shape of the cam any number of needles may be dropped

FIG. 3.

while others remain in operative position.

The ribber, which carries the ribbing-needles adapted to co-operate with the knitting-needles proper, is revolubly mounted on the pin, which latter projects downward from the bracket, adjustably arranged on the up-

right. From the under side of the ribber projects a pin engaging a recess. The lugs project inward from the cylinder as shown in Fig. 2. Above the ribber and preferably integral with the pin is a disk, being on one side cam-shaped adapted to form guide or bearing surfaces for the shanks of the ribbing-needles. On the disk is adjustably secured, by means of screws a plate, on which are fulcrumed cams and also a switch. This switch and the cams, together with the cam-surfaces of the disk, form grooves or chan-

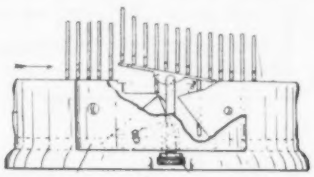


Fig. 4

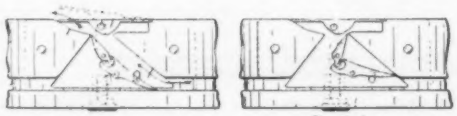


Fig. 5 Fig. 6

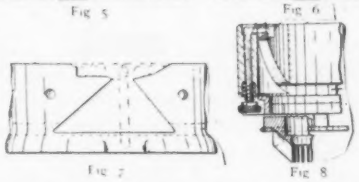
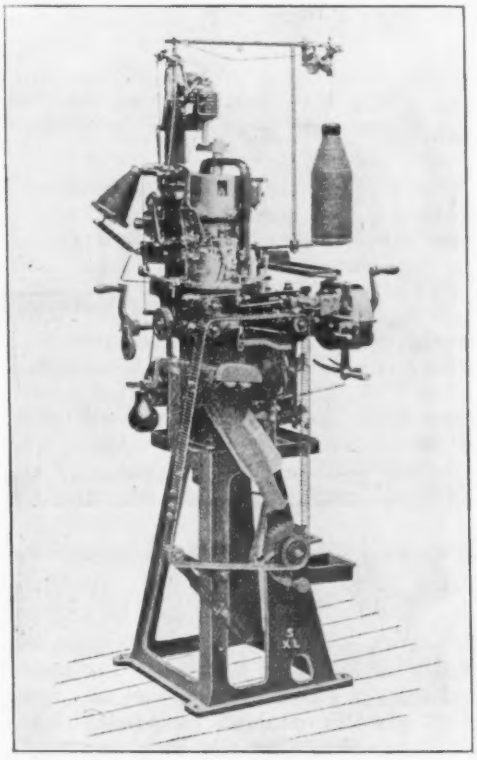


Fig. 7 Fig. 8

nels for the shanks of the ribbing-needles, as can best be seen at Fig. 9. The cams are pivotally secured to the plate and are held in normal position, Fig. 10, by means of a coiled spring. A cam projection is cast with the disk to complete the respective channels or raceways for the shanks of the ribbing-needles. When the ribber is rotated in one direction the shank of the needles will enter the channel, throw the switch over into the position shown in dotted lines and move the cam out of its normal position into the position likewise shown in dotted lines, and will then enter the channel thus formed between the cam and the cam-surface. When the ribber is rotated in the opposite direction, the shanks of the needles will enter the channel, thence into another channel, which latter is formed by the cam and cam-surface after the other cam has been moved out of its normal position by means of a pawl.

A COMBINED RIBBER AND FOOTER.

The accompanying illustration shows a new hosiery machine now being introduced into the United States by the Grosser Machine Co., 260 West Broadway, New York City. It is designed to solve the problem of finishing a stocking, including the ribbed top, etc., on one machine. This machine was invented in Europe some years ago and has been subjected to the tests of mill experience



THE GROSSER KNITTING MACHINE.

for two years in England and on the Continent, several large mills being equipped throughout with this machine. The experimental stage has been passed and the American manufacturer can start his investigations of the machine with the assurance that not only claims but facts are presented for his consideration.

The Grosser machine is especially adapted for all kinds of woolen hosiery from 60-needle goods to the finest grades. The main

feature is the automatic change from rib to plain stitch; there is consequently a saving of time and labor in transferring, unraveling and changing cylinders. The machine starts with a very good double edge, runs the rib top in 1 by 1 rib and changes automatically to the finer rib or the plain leg part. It is claimed that the goods are more elastic and fit better to the leg than does the plain circular sock.

Before the heel is started the few rib needles of that part transfer to plain work and the heel is formed in the usual way, the splicing throughout being done automatically. The foot and instep may be in plain stitch, 3 by 1, 5 by 1, or 7 by 1 fancy rib, like the leg, while the sole is knit in regular circular style. The advantage of this form and the good fit obtained commended themselves immediately to the European trade and it is said that the entire British army is provided with socks made on this machine. Owing to the popularity of this style of goods in the United States the builders are confident that knitters installing the Grosser machine will find a ready market for the product. It is said that five machines can be run by one girl because all the work required for running the ribbed tops on latch needles is dispensed with. The steady speed and continuous operation bring the product to a very high point. It is claimed that another advantage consists in the fact that less skilled labor is required.

The Grosser Machine Co. will refer interested parties to users of this machine, which is now being shown under actual running conditions.

AN IMPROVED KNITTING NEEDLE.

The object of a new construction in knitting needles, recently invented in this country, is to prevent the bent-over portion from getting out of position during the process of tempering or while in use for knitting.

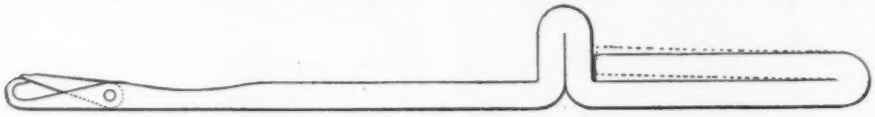


Fig. 1.

Fig. 2.

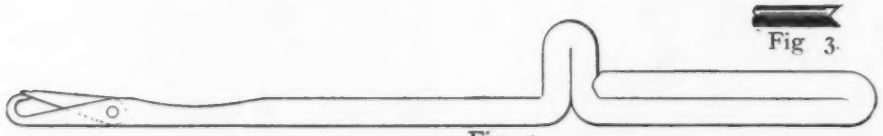


Fig 3.

Fig. 4.

Fig. 1 is a needle of the ordinary type; Fig. 2, the shank of the new needle; Fig. 3, a plan of Fig. 2; Fig. 4, the new needle; Figs. 5 and 6, the new needle at different stages of manufacture; Figs. 7 and 8, different forms of the taper end of the stock; Fig. 9, shank of new needle, corresponding to Fig. 7; Fig. 10, shank of new needle corresponding to Fig. 8.

If, during the process of tempering and hardening, the bent-over portion of the needle at Fig. 1 should be sprung out of place, the needle would bind in the machine and cause bad work. This difficulty is prevented by the use of the new needle, which is made as follows:

At some point in the preliminary steps of forming the needle, and preferably prior to the step of flattening the round wire stock of which the needle is made, the end of the stock from which the shank is made is reduced and subsequently bent over upon the

main portion of the shank in such a way as to bring the reduced end adjacent to some portion of the needle-body. Owing to the relative positions of the thinned end of the stock from which the shank is made and the portion of the needle against which it abuts, such flattening of the needle-body either crowds the material over the thinned or pointed end or causes the latter to become embedded in the body of the needle. In manufacturing a needle such as is shown in the drawings according to this invention the thinned or reduced end of the bent-over portion of the shank is brought adjacent to the heel of the needle, and during the flattening process the material in the portion of the heel adjacent the pointed end is crowded toward and over the pointed end, which end is embedded in the material of the heel.

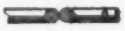


Fig. 5.

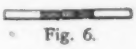


Fig. 6.

Fig 7

Fig 9.

Fig 8.

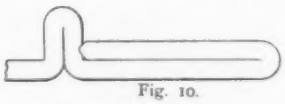


Fig. 10.

In Figs 2, 3, 4, 5 and 6 the end of the stock from which the shank of the needle is formed is thinned or reduced by forming the V-shaped notch as best seen in Fig. 3; the end of the stock is bent over upon the main portion thereof; as usual, the two ears or points formed by the V-shaped notch are brought against the material of the heel, as shown in Fig. 5. Subsequently the sides of the needles are flattened between suitable dies, as usual, and during such operation the material in the heel is forced farther into the notch 8, and at the same time the pressure applied to the ears embeds them into the body of the heel, thus positively interlocking the end of the bent-over portion with the heel of the needle, as shown in Figs. 4 and 6. This positive connection between the end and the heel prevents the bent-over portion of the shank from being sprung laterally by any friction between it and the cam mechanism of the knitting machine and also prevents the bent-over portion from springing away from the main portion of the shank.

Matching Ribbers and Hosiery Machines.

Editor Textile World Record:

We have a set of ribbers and hosiery machines for making children's hose, sizes 6 to 9. As the gauge of the ribbers is too coarse for that of the hosiery machines, we would like to change it. Please give us the exact diameter and number of needles required. The present sizes of the machines are as follows:

Ribbers:	Diameter	4	4¼	4½	4¾
	Needles 84		96	106	118
Machines:	Diameter	2¾	3	3¼	3½
	Needles 64		70	76	82

Essex (605).

In giving diameter of ribbers and number of needles, it is not stated if they are 1 by 1 rib, or 2 by 1 rib. I will assume that the number of needles given includes both dial and cylinder, that is, 4-inch, 84 needles. If 1 by 1 rib there would be 42 needles in cylinder and 42 needles in dial; if 2 by 1 rib there would be 56 needles in cylinder and 28 needles in dial. The total number of needles must be divisible by 3 without a remainder, for 2 by 1 rib. While the first two sizes given, 4-inch with 84 needles, and 4 1/4-inch with 96, are divisible by 3, the other two, 4 1/2-inch with 106 needles and 4 3/4-inch with 118, are not. From this I assume that the ribbers are 1 by 1.

In figuring the hosiery machines I find that the gauge is the same for all, 7 1/2 needles to the inch on the circumference. The ribbers, however, are not cut to a uniform gauge. The 4-inch, 84 needles, has 6 3/4 needles to the inch; the 4 1/2-inch, 96 needles has 7 1/4 needles to the inch; the 4 1/2, 106 needles, has 7 1/2 needles to the inch; the 4 3/4, 118 needles, has 7 7/8 needles to the inch.

The 4 1/2-inch ribber, 106 needles, has the correct gauge for the hosiery or footer machine, 3 1/4-inch, 76 needles. This gives 30 more stitches on the ribbed leg, which are doubled in transferring the stitches to the footer. Nearly half the stitches of the footer on the back where the heel is, should be doubled to make the fabric closer and more durable above the heel. To match the hosiery machines the ribbers should be as follows:

Ribbers:	Diameter	4	4¼	4½	4¾
	Needles 94		100	106	112
Footers:	Diameter	2¾	3	3¼	3½
	Needles 64		70	76	82

Half the needles are in the cylinder and the other half in the dial. The 4-inch and the 4 1/4-

inch ribbers are each too coarse for the footers; the 4 3/4-inch is too fine. With the present layout it is not possible to get the sizes of uniform weight. With the same size yarn and the same length of stitch the coarse gauge goods would be light in weight; the fine gauge, heavy. The diameter of ribbers for this gauge is right. All that is required is to substitute new cylinders and dials for the ribbers that are not right.

Lafayette.

Recent Knitting Patents.

KNITTING MACHINES. Take-Up for. 799,081. Albert H. Obenhoff and Dennis J. Broderick, Gloversville, N. Y.

This invention relates to a take-up mechanism for knitting machines; and its object is to produce a device by which the fabric as it is knit upon a rotary knitting machine will be automatically held at a desired uniform tension upon the needles.

Fig. 1 is a perspective view of the take-up, showing the knitted fabric as it comes from the knitting machine between the rollers of the take-up. Fig. 2 is a perspective view of the rotary portion of the

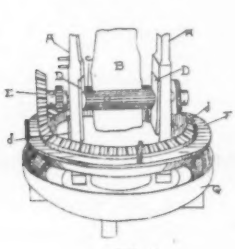


FIG. 1.

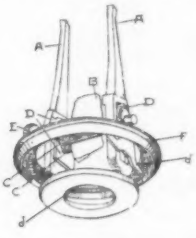


FIG. 2.

take-up device, including the rotary friction-plate.

A A, are the posts or standards attached to the knitting-head of an ordinary rotary knitting machine (not shown in the drawings) as used in knitting mills and upon which the fabric is knitted.

B, is the knitted fabric as it comes from the knitting machine and extends downward between the posts, A A.

C C, are two rollers geared together so as to turn toward each other from the top and adapted to receive the knitted fabric, B, and as they turn to draw it down between them.

The rollers, C C, have journal-bearings in the blocks or slides, D D. One end of one of the rollers, C, is provided with a gear-wheel, E, arranged to mesh with the gears upon the top of the rotating friction-plate, F. The blocks, D D, are attached movably to the posts, A A, so as to slide a limited distance up and down upon said posts.

F, is a rotary or revolving friction-plate supported from the blocks, D D, by the arms or brackets, d d, and is capable of rotating with the posts, A A, or revolving by a movement of its own, or remaining stationary while the posts, A A, carrying the rollers, C C, rotate within its circumference. Around upon the top face of the rotary plate, F, are cogs constructed and arranged to mesh with the cogs of the gear-wheel, E.

G, is a stationary friction-plate attached in any suitable means to the floor or table under the knitting-machine. The inside or bearing surface of the stationary friction-plate, G, is constructed to receive the exterior or bearing surface of the rotary friction-plate, F, and the exterior or bearing surface of the rotary friction-plate, F, is constructed and adjusted to fit nicely upon the interior or bearing surface of the stationary friction-plate, G.

KNITTED FABRIC. 806,926. Martin J. Shaughnessy, Amsterdam, N. Y.

KNITTING MACHINE. 805,670. James E. Rowe, Pawtucket, R. I., assignor to E. Jenckes Mfg. Co., Pawtucket, R. I.

KNITTING MACHINE. Circular. 805,612. Frank B. Wildman, Norristown, Pa.

KNITTING MACHINE. 806,293. James E. Rowe, Pawtucket, R. I., assignor to E. Jenckes Mfg. Co., Pawtucket, R. I.

KNITTING MACHINE. 806,921. James E. Rowe, Pawtucket, R. I., assignor to E. Jenckes Mfg. Co., Pawtucket, R. I.

KNITTING MACHINE Latch Needle. 807,210. Charles J. Sibbald, Troy, N. Y., and Damon A. Vance, Bennington, Vt., assignors to Charles Cooper, Bennington, Vt.

KNITTING MILL NEWS.

New Mills.

Massachusetts, Springfield. The Potter Knitting Company is a new concern recently organized which will establish a plant in building formerly occupied by the Hendee Manufacturing Co. Children's knitted underwear will be made exclusively. The company will be capitalized at $75,000 with Clifford B. Potter, president. It is expected that operations will be started within 60 days.

*Massachusetts, Taunton. The Taunton Knitting Company, capitalized at $50,000, are now operating their new mill on spring needle ribbed underwear. Chas. L. Macomber is president of the company; Abbott F. Lawrence, treasurer and Wm. Hurd, superintendent. Plant is equipped with 25 spring needle circular rib and 12 latch needle knitting machines and dye house. Goods are sold through the American Knitting Mills Co.

*Michigan, Williamston. F. P. Van Buren is president of the Williamston Knitting Company, with capital stock of $20,000; B. Wixon, treasurer and E. L. Watkins, superintendent. The company will start operations in January making high art knit gloves and mittens, which will be sold direct. Plant will be eqiupped with dye house and operated by steam.

*Montana, Helena. The Montana Knitting Mills are now operating 2 (German) knitting machines and 7 finishing machines, by electricity. They are to install more machinery after the first of the year.

New York, Brooklyn. Messrs. Bryan & Gasteiger, formerly with Plate & Clark, as salesman and manager respectively, have started a plant at 408-410 Berry Street, former location of the Plate & Clark mill. They are installing machinery for making sweaters, blouses, jackets, cardigans, etc., and will include Grosser machines.

*New York, Clayville. William T. Baker and Quentin McAdam are interested in the Clayville Knitting Company which will operate the old Clayville Mill, presumably on fleeced, ribbed underwear. It is stated that they do not contemplate beginning operations before spring.

*North Carolina, Lexington. Work will start during January on erection of new buildings for the Yadkin Knitting Mills, capitalized at $10,000. J. D. Grimes is president of this company; F. N. Patterson, treasurer and K. Alexander, superintendent. Men's and ladies' hosiery will be made. The mill will be equipped with 25 knitting and 2 sewing machines and dye and finishing plant. Electricity will be motive power. Goods will be sold direct.

Pennsylvania, Philadelphia. Doak & Eddishaw, Pastorius and Osceola Sts., manufacturers of ladies' and misses' fine gauge lace hosiery, are very busy. They are operating 40 knitters, 2 welters and 11 loopers, using 2/36 combed Egyptian and combed Peeler yarns. H. Eddishaw is the superintendent and buyer. This plant was started up during the spring of this year with 25 knitters by Mr. Eddishaw, who has now taken in Mr. Doak as a partner. The goods are sold direct.

Pennsylvania, Langhorne. The United States Knitting Co. is a new company which has recently started operations at this place making silk hosiery for men, women and children. They will install five new full fashioned machines in addition to the other equipment. Goods will be sold direct and through Kenney & Browne, New York.

Pennsylvania, North Wales. The new knitting factory in this town is to be equipped with 10 machines, which together with other machinery will be installed as soon as delivered. It is expected that the plant will be in operation within a few months. The party who will conduct this business is located in Philadelphia.

Pennsylvania, Philadelphia. The Carlisle Hosiery Mills are about to be started up in the annex recently erected by the Malcolm Mills on Orchard St., Frankford. Wilfrid Gray, 39 North 9th St., who will sell the product of the plant, consisting of men's fine gauge half hose, is one of the parties interested. They will operate 20 knitters, 4 ribbers and 3 loopers, and expect to be in operation within a few weeks. They will buy 32 and 40 combed Peeler yarns.

Pennsylvania, Philadelphia. Mr. Ernest Blood, 7th and Somerset Sts., is contemplating the starting of a knitting mill for the manufacture of a general line of seamless hosiery including ribbed goods and half hose. The location of the plant and the number of the machines have not yet been decided on, but it is expected that the plant will be in operation during the first quarter of the coming year.

Pennsylvania, Philadelphia. The Ideal Hosiery Mills, recently reported by us as about to start up at 2821 Jasper St., is now in part operation on ladies' and misses' lace hosiery which they are turning out on 22 knitters, 3 loopers and 1 welter. The proprietors of the establishment are Jones & Poetsch, Mr. Poetsch (Page) being formerly connected with Wallace Wilson, Frankford. The goods are sold direct. They are buying 2/36 and 2/40 carded peeler, 1/60 combed peeler and 1/18 mule spun Eastern cotton yarns, Mr. Poetsch being the superintendent and buyer. The plant is now being run on samples.

Pennsylvania, Philadelphia. F. E. Munich with John Breslin as superintendent, is equipping a plant in the Bromley Mill at Jasper and York Streets with 70 knitters, 4 loopers and 2 sewing machines, for the manufacture of ladies' lace and plain hose which will be sold direct.

Pennsylvania, Priceburg. A new knitting plant has been started here by Geo. Hilwig, making high grade sweaters, blouses, jackets, etc., with 3 (Grosser) machines now in operation. David Knopfel is superintendent of the plant.

*Pennsylvania, West Chester. E. M. Rust contemplates starting his new hosiery mill this week. The number of operatives will be increased as work advances.

Pennsylvania, York. A new knitting mill will shortly be started here at Green Street and College Avenue by Samuel Buck & Son, formerly employed at the Black Knitting Mill.

*Tennessee, Cleveland. The Cleveland Hosiery Mills, a new concern, will start operations about February, 1906. This company has erected a new two story brick mill, 206 by 60 feet, and one story boiler and engine room, 58 by 38, and installed 65 standard knitters, 65 Brinton ribbers and 20 loopers. A Corliss engine and two 125 h. p. boilers for motive power.

*Wisconsin, Marinette. The Marinette Knitting Mills, which have been running in an experimental way for the past year, expect to organize a fair sized company in January. At present they have an equipment of 26 machines and will probably install nearly that many more.

Enlargements and Improvements.

*Georgia, Columbus. Preparations are being made for installing the additional machinery in the Georgia Manufacturing Company's mill. They will add 1,800 more spindles and a number of knitting machines and pressers.

Georgia, Rome. The Rome Hosiery Mills have placed an order for a full equipment of automatic knitters with The E. Jenckes Mfg. Co., who will supply 75 Invincible full automatic machines.

*Georgia, Rossville. The new addition, in which the Richmond Hosiery Mills will install 5,000 spindles, will be completed January 15th.

Kentucky, Paducah. Plans and specifications are being prepared for another addition, 50 by 60 feet, two stories, to the Dixie Mills. About forty (ordered) knitting machines will be installed. A new steam engine has been installed for furnishing additional power.

New Hampshire, Lebanon. The Everett Knitting Works have purchased additional machinery which will be installed in the mill during this and next month.

New Jersey, Beverly. The Beverly Underwear Co., manufacturers of ladies' and children's knit shirts and pants on 33 knitters and 55 sewing machines are experimenting with new machines with

a view of increasing their production. They are very busy.

New Jersey, Newark. The New York Knitting Co., 84 W. Kinney Street, has recently removed to these larger quarters, where 4 additional (Grosser) machines will be added.

New York, Brooklyn. Plate & Clark have placed order for 11 Grosser machines, part of which have already been set up. It is expected that the balance will be installed by February.

New York, Cohoes. The spinning and carding departments of the Tivoli Mills have been closed and the balance of the plant will be shut down in a couple of weeks. A new sprinkler plant will be installed and various other improvements made.

*New York, Johnston. The Diana Knitting Company has completed work on the erection of a new dye house.

*Pennsylvania, Coopersburg. The improvements reported contemplated by the Coopersburg Knitting Mill are contemplated for next year.

*Pennsylvania, Macungie. The new knitting mill for John Rems & Sons is nearly completed and will soon be ready for occupancy.

Pennsylvania, Mechanicsburg. Joseph Black Sons & Co., York, have purchased the equipment of the Windsor Knitting Mill and will operate same at this place as a branch mill. The building is being remodelled and improved automatic machinery will be put in. They propose making goods in "the white" at this mill, sending it to the York plant to be dyed.

Pennsylvania, Norristown. The new mill for the Ballard Knitting Co., located on Lafayette St., between Chain St. and Franklin Ave., is now completed. The machinery from the old building is now being removed to the new location and is expected to be in operation within a week or so. This concern operates 30 knitters on underwear webbing and anklets for jean drawers of cotton and mercerized yarns and is doing a good business.

Pennsylvania, Philadelphia. Messrs. Miller & Sons, recently mentioned by us as purchasing the mill of Noah Barlow at 53d and Westminster Ave., West Philadelphia, are now equiping the building with new machinery consisting of 50 knitters from the National Knitter Co., and Paxton & O'Neill, which they will operate as heretofore on women's plain and fancy hosiery, selling the product direct. The basement is being fitted up as a dyeing department and it is their expectation to be in operation within two or three weeks, at which time they expect to employ a night and day force to enable them to fill their orders of which they have a large number on hand.

Pennsylvania, Philadelphia. The Oneida Hosiery Co., which started up in Philadelphia at 1514 North Front St., has in operation 46 knitters and 13 loopers which they are running full time on children's, boys' and misses' ribbed hose. H. M. Gwyn is the buyer and manager and S. B. Biddle, superintendent. The goods are sold direct.

Personals.

Connecticut, Addison. It is reported that the Glastonbury Knitting Company, operating a branch mill at Manchester Green, proposes removing same to this place and combining with the local mill.

Iowa, Des Moines. At the annual meeting of the stockholders of the Des Moines Hosiery Mills, H. M. Rollins was re-elected president of the company and J. F. Norton, vice-president. Ralph E. Rollins succeeds B. Dennis as secretary of the concern. S. P. Kneeland was elected treasurer.

Iowa, Elkhorn. The Olsen Knitting Company has been incorporated to continue the plant started by the Olsen & Sons Knitting Co.

Maine, Bowdoinham. It is reported that Messrs. Cobb & Huntoon of the Brunswick Knitting Works are to locate their business in this place. A new building now being constructed by T. M. Millay will be built to suit their convenience. It is expected to have the plant ready for installation of machinery within a few weeks.

Massachusetts, Pittsfield. The Musgrove Knitting Company is operating the plant nights.

*New Jersey, Burlington. The Burlington Knitting Co., which recently went into the hands of a receiver, has been sold to T. P. Eltonhead, the superintendent and one of the stockholders of the old company. Mr. Eltonhead is removing the machinery to the three-story mill back of the water works on Pearl Street, where it will again be started up on women's knit underwear, ladies' hose and men's half hose. The equipment of the new plant will be 50 knitters, 48 sewing machines and 5 loopers. Steam, electricity and gas will be used as the motive power and the goods sold direct. Mr. Eltonhead does not at present know under what name he will run the business, but stated that the old name will be discontinued.

New Jersey, Delanco. The Star Knitting Mills, of which C. E. Barnitz is the proprietor, is about to be overhauled in the way of putting in new knitters and a finishing plant. Mr. Barnitz manufactures women's seamless cotton hosiery for which he has been receiving many orders and which will necessitate him enlarging his plant as soon as possible.

*New York, Clayville. The Clayville Knitting Company is to be organized by Utica capitalists to operate the mill at this place.

*New York, Johnstown. At meeting held recently by the directors of the Johnstown Knitting Co., W. D. Ferres was elected president; Frank Van Brocklin, vice-president; N. F. Wells, treasurer, and Alfred D. Dennison, secretary.

New York, New York. The New York Hosiery Mills have been incorporated with capital stock of $2,500. David Sobel, N. Sobel and K. Sobel are mentioned as the incorporators.

New York. Port Henry. J. D. Shahan of this place is interested in getting estimates on machinery and for a knit goods plant.

New York, Valatie. The Harder Manufacturing Co. is operating two of the mills until 9 o'clock evenings.

*Pennsylvania, Mount Union. The new hosiery mill proposed by H. A. Romberger and reported to be built at Mt. Olive, is to be established here. It is stated, however, that the probabilities are that nothing will be done in this matter before spring owing to scarcity of labor on construction work.

Pennsylvania, Norristown. Chas. Templeton is now the sole proprietor of the Keystone Knitting Mills Co., at 36 E. Marshall St., which he is running under his own name. The plant is running on children's and misses' cotton hosiery on 125 knitters and 11 loopers, with Samuel W. Winslow as superintendent and general manager. The goods are sold direct, the plant being run by both steam and electric power. They have large numbers of orders on hand and are running full time.

Pennsylvania, Norristown. The Eureka Knitting Co. has recently elected Walter Moyer, of Reading, Pa., as its treasurer; Mr. Adams still retaining the presidency and superintendency. The plant is located at the foot of Swede St. and has a capital of $50,000; operating 38 knitters and 38 sewing machines on cotton ribbed underwear, which they are selling direct and for which they are receiving many orders.

Pennsylvania, Palmyra. The Palmyra Hosiery Mills, S. F. Engle, proprietor, have sold the plant to W. L. Kreider's Sons.

Pennsylvania, Philadelphia. The Crossingham Knitting Mills, Ashmead St., Germantown, well known manufacturers of wool, cotton and worsted ladies', misses' and children's underwear on 60 knitters and 70 sewing machines, has added a line of ladies' and misses' skirts of wool and cotton for which he is receiving good orders. The mill is running full time.

Pennsylvania, Philadelphia. James R. Kendrick, 133 Harvey St., Germantown, has applied for a charter, the concern to be known as the James R. Kendrick Co., with James R. Kendrick, Elizabeth M. Kendrick and T. Frank Kendrick as the incorporators. The production of this plant is surgical hosiery which they turn out on 20 knitters and 9 sewing machines, selling the product direct.

Pennsylvania, Philadelphia. E. Noon & Son, 4019 Germantown Ave., for many years operating 30 knitters on bathing suits and striped underwear, doing their own dyeing, report that they have given up the manufacture of underwear entirely and are now making bathing suits only, which they sell direct and for which they are receiving many orders.

Pennsylvania, Philadelphia. George Bannister, 82 and 84 Armat St., Germantown, is now manufacturing fancy knit goods, skirts and leggins, having discontinued making bicycle hosiery, eiderdown sacques and robes. He is running 12 machines and reports business as good.

Pennsylvania, Philadelphia. William Eliot, formerly at 212 Kaighns Avenue, Camden, N. J., has removed to this city at Germantown and Wyoming Avenues. He has in operation 2 body frames, 1 sleever, 1 winder on cardigan jackets and fancy knit goods which he sells direct. He reports a good business.

Pennsylvania, Philadelphia. The National Hosiery Co., Sepviva and Hazzard Streets, have their plant at this time in full operation. The equipment of 130 knitters is now in and they are running on ladies' lace and plain hose in mercerized and lisle, children's fine gauge full fashioned and misses' ribbed hosiery, selling the goods direct. Gustav Rumpf is the manager and buyer. They are using 30/2 to 50/2 and 60/1 and 70/1 yarns.

*Pennsylvania, Reading. L. M. Miller & Co. will operate the plant formerly known as the Mt. Penn Knitting Company, making ladies' knit ribbed underwear. They will sell direct.

Pennsylvania, South Bethlehem. The Austin Knitting Co., which started operations about two years ago, reports being very busy. They are operating 35 knitting machines on cotton half hose. Goods are sold through D. C. Dalsimer, New York. W. H. Jacobs is superintendent and manager of the plant.

*Vermont, Bennington. Although the Bennington Knitting Company has resumed operations, several of the departments are idle owing to scarcity of help.

Virginia, Dayton. It is reported that the Lewis Jones Knitting Company has made a proposition to the town relative to establishing a plant here, and that portion of the necessary amount ($25,000), be subscribed locally. J. Rhodes and H. L. Loomis are actively interested.

Wisconsin, Madison. The Hand Knit Hosiery Company has been incorporated with capital stock of $20,000 by R. H. Ehaney, H. Cheseboro and A. B. Bentz.

The night employes of the spinning room at the Robert McKinnon knitting mill, Little Falls, N. Y., presented the overseer, Henry Parker, with an umbrella and a silver tea set for a Christmas present.

Samuel Reynolds, who has been for some time past superintendent of the knitting mill at Plainville, Conn., and also of the mill of the Bristol Mfg. Co. for eight years, has resigned. His successor will probably be Edgar Bentley.

F. Louis Barr, formerly of Elkhart, Ind., has accepted a position with the A. C. Staley Mfg. Co., South Bend, Ind.

Geo. W. Hawk has been engaged to act as general manager and assistant treasurer for the Gem Knitting Mills Co., Reading, Pa.

James A. Holmes, who has been superintendent of the Springfield Knitting Co. for the past seven years, resigned and was tendered a reception by the employes recently and presented with a handsome gold watch.

M. F. Daley, formerly superintendent of the carding and spinning departments in the Oneita Knitting Mill, Utica, N. Y., has succeeded L. A. Pitcher as general superintendent of the Valatie Knitting Mill, Hudson, N. Y.

C. F. Agans, late foreman of the press room, has taken the position as superintendent with the Kendall Knitting Co., Utica, N. Y.

Elmore Temple has accepted the position in the Harvard Knitting Mill, Wakefield, Mass., recently left vacant by the resignation of Lauren McMaster.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.
We invite machine builders and others to send us such information for this department.

Rotary Fire Pump. The Humphrey Machine Company of Keene, N. H., have recently put upon the market a rotary fire pump built from the latest underwriters' specifications and designed to satisfy all requirements of this type of fire pumps.

Spring Needle Knitting Machine. The Crane Manufacturing Co., Lakeport, N. H., have recently placed on the market a new spring needle circular rib knitting machine, which embodies many improvements.

Tension for Nappers. J. Marx & Co., London, England. An improved tension regulating device for raising or felting machines.

Carboy Barron. Donovan & Co., Manchester, England. An improved carboy barron and tipping stand, said to be very convenient.

Lamp Pendant. George Johnson & Co., Blackburn, England. An anti-vibrating pendant for gas burners equipped with incandescent mantles.

Speed Indicator. George Thomas & Co., Manchester, England. A portable indicator for indicating the speed of spindles.

Ring Spinning Frame. Carl Hamel, Schoenau, Germany. A new spinning frame with vibrating rolls combining the principle of both the ring frame and the mule. A description appears in another part of this issue.

Moire Device. Penicaud, Malatre & Co., Paris, France. A loom attachment for producing moire effects during the weaving process, described in this issue.

Velvet Cutter. Benjamin Sinclair Smith, Paisley, Scotland. An improved machine for cutting pile fabrics.

Bobbin Winder. J. Scharer-Nussbaumer, Erlenbach, Switzerland. A machine for cross winding yarn on cone bobbins. It is said to be giving excellent results in Swiss mills.

Napping Machine. G. Grozinger, Jr., Reutlingen, Germany. An improved napper for woven and knitted goods which is said to possess many advantages over other machines for this purpose. On the napping cylinder are 24 horizontal rows of short spools covered with wire napper clothing. Each of these spools is adjustable and can be placed either in a horizontal or a diagonal position. It is claimed that a much thicker nap can be raised when the rolls are in an oblique position. The waste is also said to be very low.

Rewinding Machine. The Geo. W. Payne Co., Pawtucket, R. I., are placing on the market a machine for rewinding imperfectly spun filling bobbins and thus effecting an important saving of waste from this source.

Dyeing Machine. Otto Kunz, Vienna, Austria. A dyeing machine for skein yarn: the skeins are suspended on square revolving bars by which they are kept moving through the liquor. Suitable arrangements are made for lifting the working parts so as to remove the yarn from the liquor when desired.

Moistening Machine. J. Kroell & Co., Dammerkirch, Alsace. A machine for dampening yarn on cops, spools or in skeins in order to give the desired degree of moisture before manufacturing or selling.

Bleaching Machine. J. M. J. Baudot, Tourcoing, France. An electrolytic bleaching apparatus which is connected with a scouring machine. It is said to have given very good results in the tests that have so far been made.

THE BEAUMONT COP DYEING, BLEACHING AND SIZING MACHINE.

The accompanying illustrations show the Beaumont cop dyeing machine, which has been thoroughly tested with satisfactory results in Europe. It enables manufacturers at a small outlay to install a plant for coloring, bleaching and sizing yarn on cops at a low cost of operation. It will handle wool, cotton, silk and hemp. One man and a girl can keep a No. 1 machine in operation turning out 270 pounds of weft cops in ten hours. It is said that 400 pounds of twist cops can be dyed in the same time. One man and two girls can operate a No. 2 machine, doing twice the amount of work.

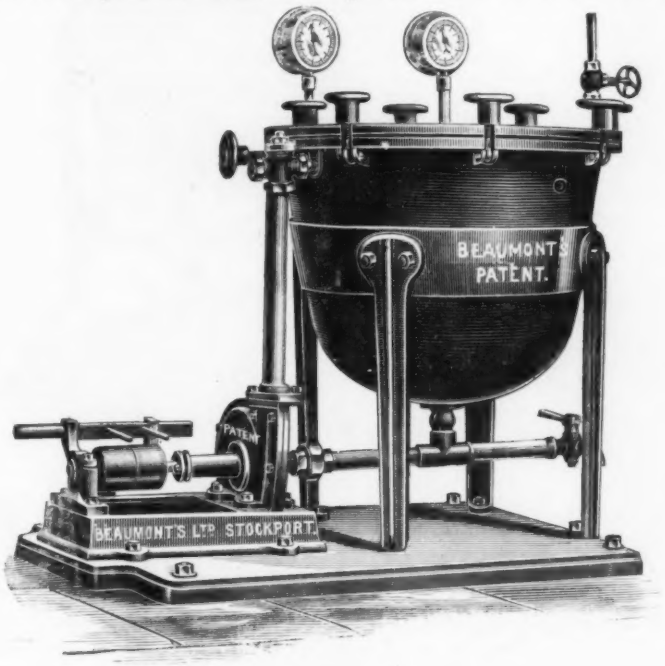


FIG. I.

The builders of this machine, Beaumont's Limited, Pump Works, Brinksway, Stockport, England, say it is impossible for a single cop to leave the plate during the operation of dyeing, bleaching or scouring. The liquor can be drawn from the machines by reversing the circular pump and without stopping the machine. The Beaumont machine will dye, bleach and scour quick traverse bobbins up to the full thickness, also roving bobbins, tape and other warps. The Leeson spool, or the Universal cone, as it is known in this country, is dyed with great success by the Beaumont machine; as it has been found that the uniformity of lay of the yarn in the "Universal" package gives uniformity and evenness of color in the dyeing process, as the dye distributes more evenly than with irregularly wound packages. It is claimed that carpet yarn in cop form can be sized to any degree of stiffness by treatment for ten minutes in this machine. The yarn can be dyed and sized in the same bath if required. It is also claimed that the No. 4 machine will dye and size 4,500 pounds of yarn per day. There is claimed to be no waste because the cops are kept in good order and the yarn leaves the cop without difficulty during weaving. The builders state that the machine affects a considerable saving of time because the cops are dyed as they come from the spinner, thus dispensing with the delay caused by reeling, drying and spooling. The yarn is dyed an even shade in either light or dark colors.

The Beaumont's Ltd. Pump Works also build a cop liquor extractor used in connection with the cop dyeing machine, and which greatly facilitates the drying of the cops after

dyeing, bleaching or washing. As already stated the Beaumont's dyeing and extracting outfit can be installed at a low cost, and the results obtained in European mills seem conclusive of the reliability of the process. The Beaumont dyeing machine is made in two forms. Fig. 1 shows the type based on the vacuum and pressure principle with circulating pump and all connections complete; two cop plates, two sets of skewers for filling alternately, anti-floater, pressure relief tap, vacuum and pressure gauges, and also tap for running off the liquor. Fig. 2 shows the regular vacuum machine with the same accessories that go with the other type. Further information can be obtained from the builders, who will be pleased to answer all inquiries regarding the machines.

FIG. 2.

In the 24th year of Henry VIII. it was enacted that for every sixty acres of land fit for tillage one rood should be sown with hemp or flax seed, "for the better provision of nets for help and furtherance of fishing, and for eschewing of idleness." In the next century the raising of flax in Ireland was restrained and every sort of hindrance put upon its cultivation, with a view of aiding the wool trade in England.

A MEASURING CLOCK FOR CLOTH PERCHES.

Any one who has had experience in measuring or examining cloth on a perch will know at once upon examining the perch clock built by Parks & Woolson Machine Co., Springfield, Vt., and shown in the accompanying illustration, that it was designed by one entirely familiar with the practical requirements of such a device. It registers lengths up to 100 yards; over that length it is easy to keep the count in multiples of one hundred. This makes it more convenient than the ordinary 50 or 75-yard machine. A large dial is used with a diameter of 16 inches. This enables it to be graduated to eighths of a yard without having the marks crowded. They show clearly even in a dimly lighted room.

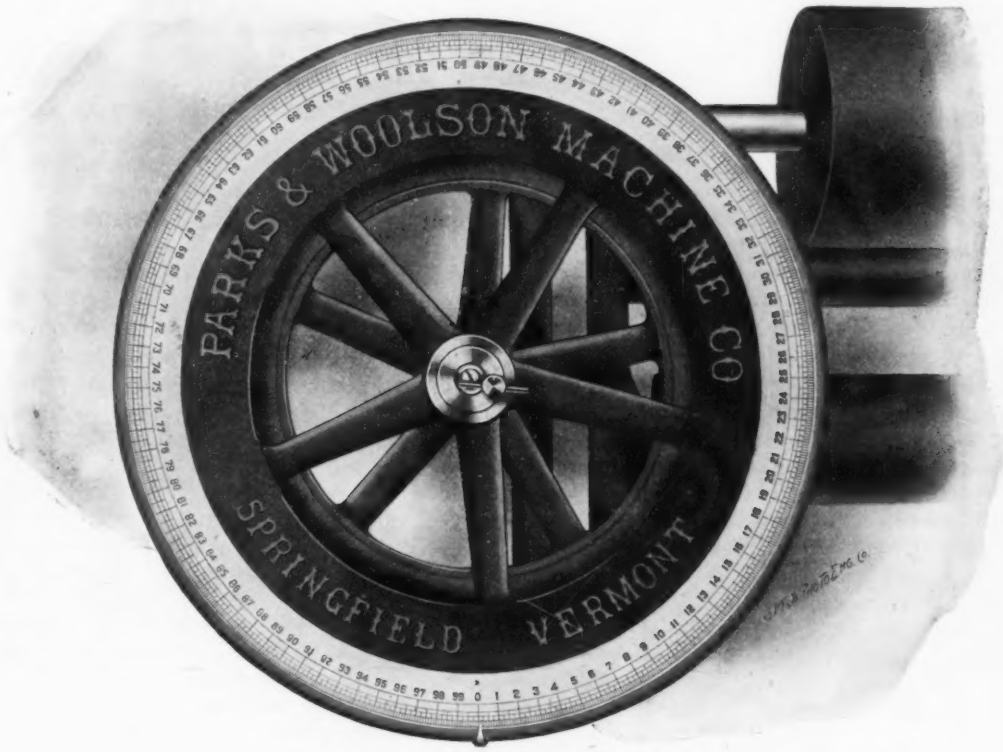
The length is indicated at the lowest point on the dial by a stationary pointer. The operator reads the length at a glance and always at the same point. After the measurement is finished a thumb screw in the centre is loosened and the dial turned back to the zero point at which it is stopped without attention on the part of the operator. The thumb screw may be dispensed with en-

tirely if desired as the friction between the dial plate and worm gear hub is enough to hold the dial in position without it. It is used only to make assurance doubly sure.

The dial is numbered at each yard so that mistakes in reading are practically impossible. The dial sheet is of white celluloid, marked with distinct black lines. This celluloid sheet can be washed when necessary and is mounted on a cast iron plate in such a way that it can be readily removed. Owing to the continual handling to which the average dial is subjected, the marks on the old style nickel plated dial soon become obliterated by wear, acid and dirt. In the new Parks & Woolson clock the dial is handled by a metal margin so that even the plate itself need not be touched at all. A new celluloid sheet costs but a trifle to put in place and makes the clock as good as new. The regular roll is 80 inches in length, but special sizes are furnished when desired. The circumference of the measuring roll is one-half yard, but can be made twice this size, in which case greater accuracy in measuring is obtained. An expansible pulley and belt mechanism may be interposed between the measuring roll and dial, if it is desirable to have an adjustable measuring device. By it, one can compensate perfectly for the difference in stretch, weight or thickness of different cloths.

When it is desired to measure continuously over 100 yards, an auxiliary dial is added registering up to 500 yards, 1,000 yards or as high as may be wanted.

These measuring drums and clocks can be driven by power if desired. This is especially convenient when long lengths are to be measured.



THE PARKS AND WOOLSON MEASURING CLOCK.

"Where England beats all other countries, except Japan, is in the climate. Climate is a very potent factor in spinning very fine yarns." Witness before the British Tariff Commission.

ENGINE ACCIDENTS AND THEIR PREVENTION.

The manufacturer whose power is furnished by a steam engine never knows when that agent of production will become an instrument of destruction and put his entire plant out of commission for weeks or months, perhaps killing or maiming valued employes, possibly taking his own life. For the racing engine and the bursting flywheel are no respecters of persons and not infrequently spare the engineer and other attendants only to kill somebody in a distant part of the works or even on the street blocks away. Flywheel insurance, however necessary, is not sufficient protection, in fact, is no protection at all, for the simple reason that it does not prevent accidents.

There is one way to prevent engine accidents, a way that forestalls the destruction of life and property and profits, which no form of insurance can restore, and we feel that in bringing it to the attention of our readers we are rendering a truly important service to them. The method referred to is an electrical device known as the Monarch engine-stop and speed limit system. It is applied directly to the throttle of the engine without breaking connections, shutting down or otherwise interrupting business. It is actuated automatically by the engine itself, on the instant that a predetermined limit of safety is exceeded, preventing that overspeeding or "racing" which almost invariably results in a bursting flywheel and the consequent loss of life or property or both. It may also be operated from any part of the shop or works by means of push switches in case of accident to men or machinery, and this feature alone has not only averted serious injury or death to hundreds of workmen, but has saved many thousands of dollars in costly machinery as well.

When reading in the daily papers accounts of serious engine accidents (which seem to be of more and more frequent occurrence and to happen in large and well regulated plants in spite of the most watchful care on the part of thoroughly competent engineers), we are reminded of that old saw, "An ounce of prevention is worth a pound of cure," and of its application to this subject.

The manufacturers of the system referred to, the Consolidated Engine-Stop Company, 100 Broadway, New York, claim that with hundreds of installations in all parts of the country, they have yet to hear of a single case in which the system has failed to do all that is claimed for it; and they support this claim by the testimony of more than eighty of their customers, many of whom have had occasion to test the apparatus in emergencies that threatened both life and property. This testimony appears in a booklet "As Others See Us," which the company will be glad to send on request, together with a new catalogue describing the system in detail and "What Justice Douglas Said," the last being an account of the employers' liability action in the Supreme Court of Rhode Island in which a verdict was found for the defendant because of the Monarch system and its prompt action when the push switch was pressed, saving a workman from serious injury in a machine. The annual sacrifice due to a false sense of security on the part of engineers and engine owners would be appalling if the totals in lives and dollars were definitely known, to say nothing of the profits lost through idleness of plants following such accidents, and the suffering due to loss of wages by employes.

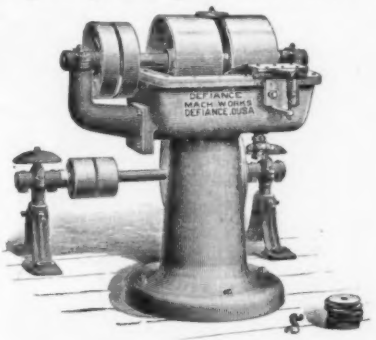
It is to be hoped that these lamentable losses will be very materially reduced year by year through the general adoption of a preventive means, whose certainty of action has been so thoroughly demonstrated.

AN AUTOMATIC SPOOL HEAD GLUING MACHINE.

The accompanying illustration shows the spool head gluing machine built by the Defiance Machine Works, Defiance, Ohio, which has been specially designed for the use of spool-makers to spread the glue rapidly and correctly over the surface of wooden discs used for building up in cross section spool heads or flanges to prevent their checking. This work is accomplished rapidly by a cheap operator by simply placing the disc over the steel pin, when the glue is uniformly spread over the surface more accurately and with less loss of glue and at an

immense saving in time over the use of a brush.

It is constructed on a heavy iron frame with cored centre and a broad floor base, with the working parts accurately fitted to it. The top of the frame consists of a hollow water case, which is provided with steam pipe connections to keep the water hot for heating the glue. The top portion of the water case is galvanized and forms a hollow receptacle in which the glue is placed and the two glue spreading drums rotate. These



A SPOOL HEAD GLUING MACHINE.

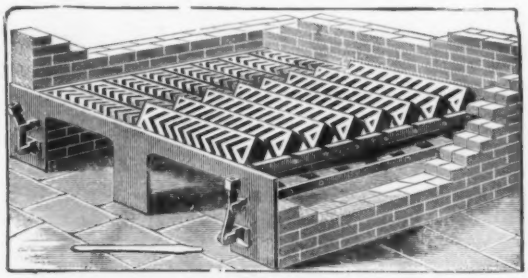
drums and their shaft are of solid bronze, together with the glue-pot. Being galvanized prevents corrosion. The drums travel in opposite directions to rotate the spool head, which is properly covered with glue in making a one-half rotation. From this it will be easily understood that the glue is instantly spread over the surface of the work. To each glue drum an automatic device is fitted for regulating the amount of glue to be delivered to the work.

This machine is capable of spreading glue on discs from the smallest sizes up to 14 inches diameter, handling all sizes of work at the same speed, doing the work so rapidly that the glue will not have time to set between this machine and the spool head press.

Among the Normans veils were frequently made from richly embroidered silk or gold tissue and the fashion became so widely imitated that in the 15th century a law was passed in Scotland forbidding any woman to "come to church or to market with her face muffalit."

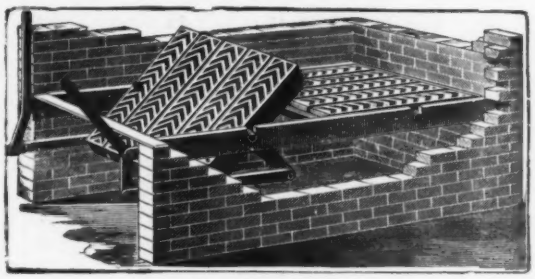
THE TUPPER SECTIONAL GRATE.

During the last eleven years the Tupper grate, shown in the accompanying illustrations, has been furnished to more than 8,000 users. It has proved to be thoroughly economical and serviceable and the manufacturers, W. W. Tupper & Co., 24 State street, New York, are confident that it is excelled by no other grate on the market.



NO. 5. ROCKING GRATE.

Among the claims made for it is that it cannot be warped or broken, and that it is interchangeable, so that new parts can be substituted at small cost. The truss bars underneath are independent of the grates and not affected by the heat, allowing the bars to expand and contract freely without strain.



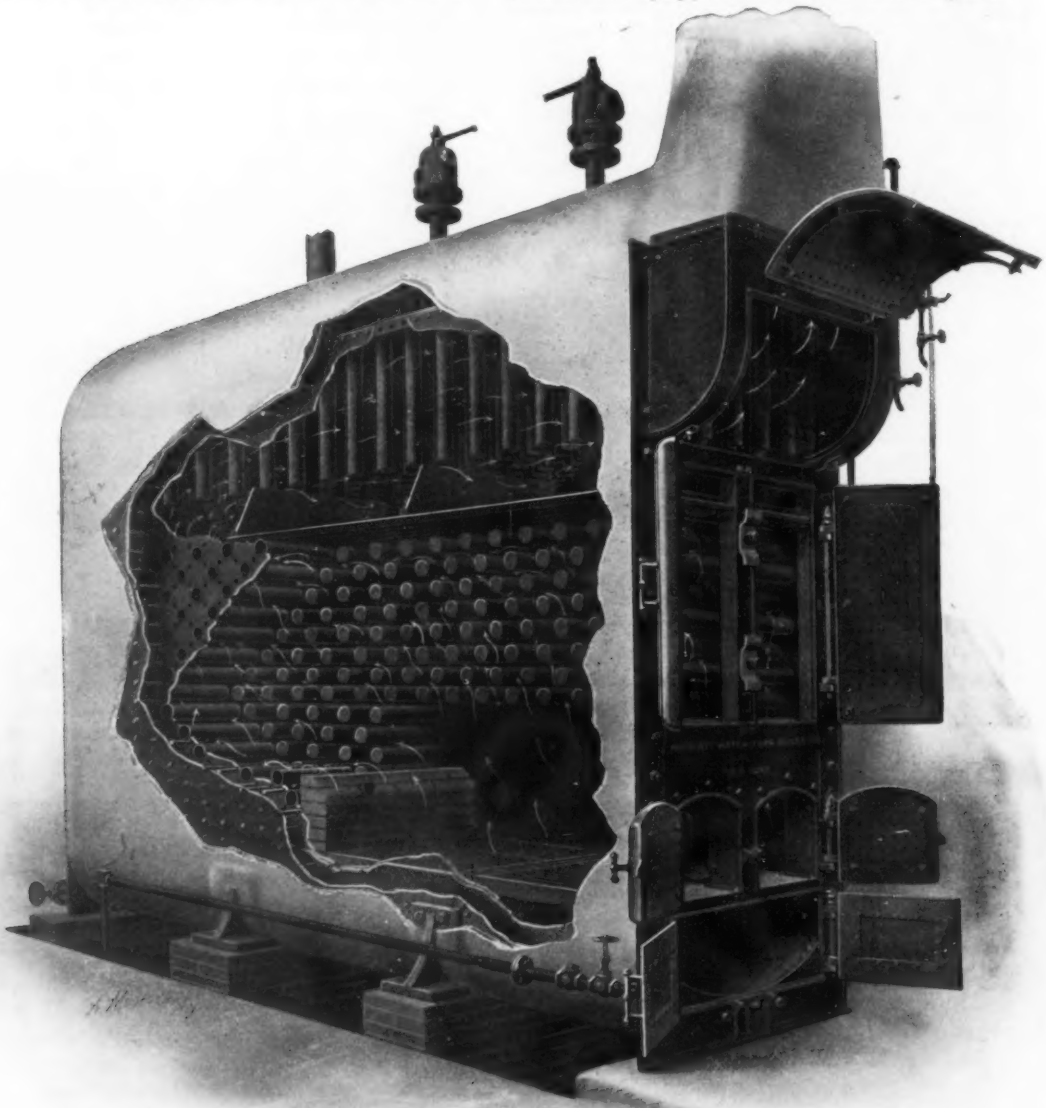
NO. 6. DUMPING GRATE.

The large proportion of air openings results in easier steaming, more perfect combustion of the coal and less clinker. The Tupper grate is made in various forms for either horizontal or upright boilers, to both of which types it is well adapted. During the many years in which the Tupper grate has been in use a large number of testimonials to its merits have been received.

THE KINGSLEY WATER TUBE BOILER.

Coal bills being such a large factor in manufacturing costs, it would seem that steam users should devote more attention to reducing costs of steam production. It is an interesting fact that the economical production of steam in the boiler room receives much less attention than does the economical use of steam in the engine room.

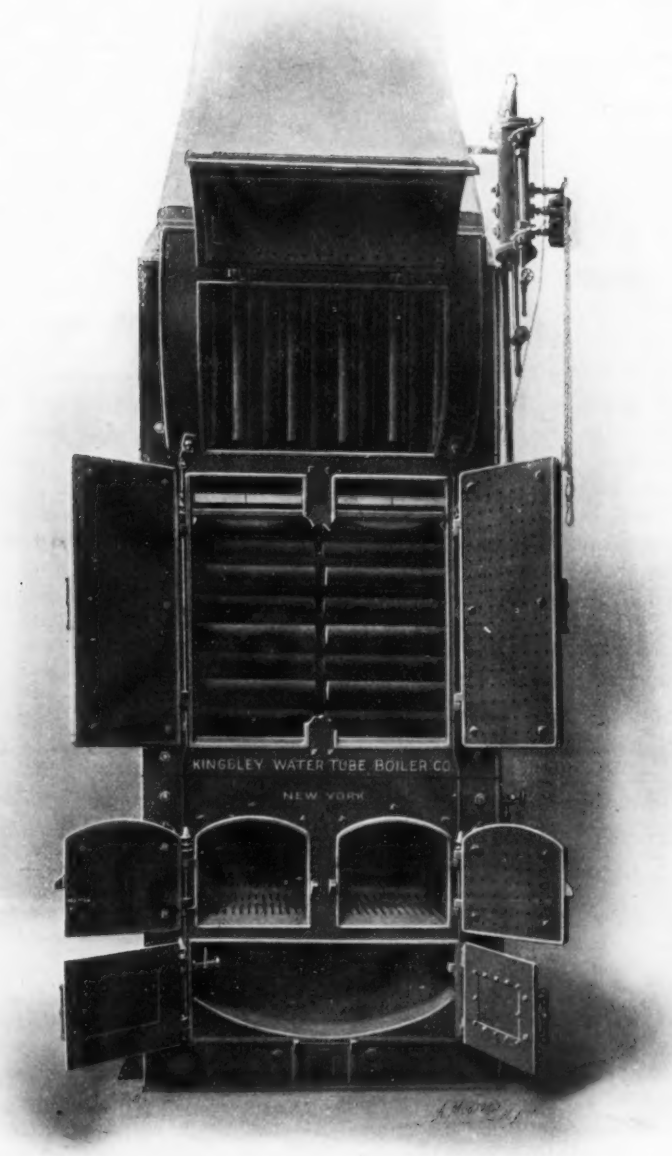
In many of our manufacturing plants, which use steam for power, the engine rooms are equipped with up-to-date engines and auxiliaries, while in the boiler room is found the same style of steam boilers our grandfathers used. This condition is not be-



SECTIONAL VIEW OF HORIZONTAL KINGSLEY WATER TUBE BOILER.

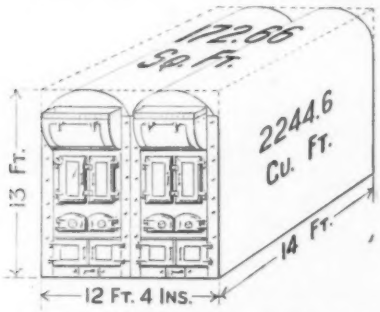
cause improvement is impossible in the boiler room, it is because the most talent and money has been devoted to the attractive side of steam engineering.

In marine engineering, limitation of space on board ship and high service requirements have forced improvements in engine and boiler practice alike, with the result that a



FRONT VIEW OF HORIZONTAL KINGSLEY WATER TUBE BOILER.

consumption of less than two pounds of coal per hour per horse power is common practice. It is a question whether the average stationary steam plant is producing the same power with double the fuel cost. The increasing use of water tube boilers in our



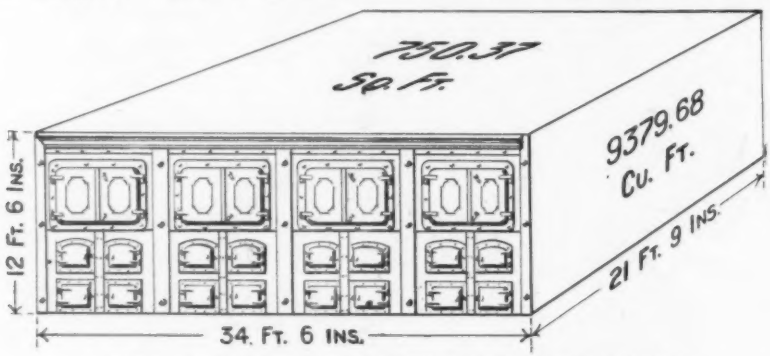
500-H.P. INSTALLATION OF KINGSLEY BOILERS.

large manufacturing centres seems to denote that this type of boiler has come to stay.

The best is the cheapest in the boiler room as well as in the engine room. In this connection our readers will be intersted in the accompanying illustrations of a horizontal, internally fired water tube boiler, manufactured by the Kingsley Water Tube Boiler Company of State street, New York. This internally fired water tube boiler seems to combine many of the principles and merits of the well known shell boilers of the return tubular and Scotch type, with the quick steaming qualities of the ordinary externally fired bricked-in water tube type.

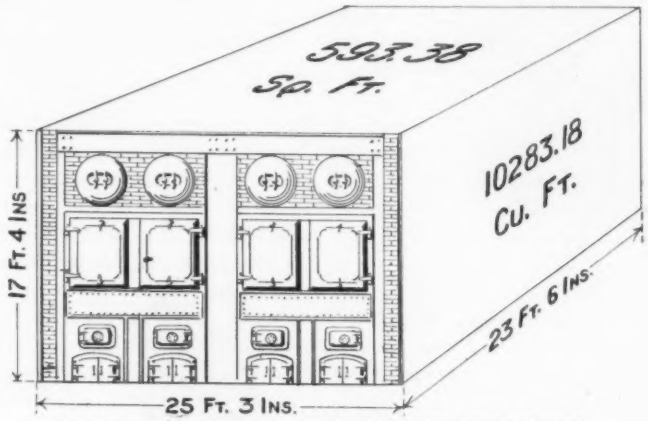
The Kingsley boiler is constructed with an outside and inside steel shell, proportioned and stay bolted to withstand any required steam pressure up to 200 pounds per square inch. These boilers are built in units ranging from 100 h. p. to 350 h. p. each. From the inside steel shell, 3 inch diameter charcoal iron water tubes are projected into the combustion chamber at right angles from both sides and from the top or crown sheet of the boiler. These tubes are so placed as to be at right angles with the course of the burning gases, and so attain the greatest possible efficiency as steam generators. The adjustment of the shells and water tubes is arranged to divide the water into small parts over all of the heating surface, and thus facilitate the most rapid evaporation. It is claimed that the efficiency of the heating surfaces in this boiler is phenomenal in consequence of the water being carried completely around, in and over the combustion chamber, with the results that in practical use a boiler horse power is developed for each 6 square feet of heating surface. The builders of the Kingsley boiler state that in tests a horse power has been produced on each 4 square feet of heating surface, and an engine horse power attained with less than two pounds of coal per hour per horse power.

A unique feature of this boiler is the design for automatically purifying the feed water before it reaches the horizontal heating surfaces where scale forming matter can deposit and bake. The water is carried in narrow walls against vertical heating surfaces, so that the heat can penetrate the water quickly and force the precipitation of all scale forming matter to the sediment chamber at the bottom of the boiler, where it is held in solution until blown off from time to time, as may be necessary, through openings



500-H.P. INSTALLATION OF CYLINDRICAL RETURN TUBULAR BOILERS.

provided for the purpose. That this method of maintaining clean heating surfaces is successful is certified to by steam users that have adopted this boiler. Water tubes removed for examination after three years' continuous use are found to be as clean and perfect as when new. This feature should assure durability and safety, as well as fuel economy. The claim that any given quantity of horse power of Kingsley water tube boilers can be installed in one quarter the space necessary for any of the bricked-in steam boilers will commend this boiler where boiler room space is limited.



500-H.P. INSTALLATION OF BRICKED-IN WATER TUBE BOILERS.

The Kingsley boiler is being extensively adopted by steam users in New York, and it is claimed that it will evaporate any given quantity of water into absolutely dry steam for 30 per cent. less coal cost than any of the steam boilers in common use. The builders solicit inquiries and investigation by steam users regarding its merits.

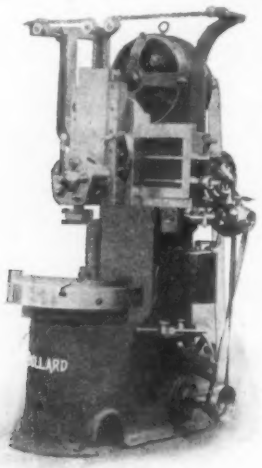
Needles were first made in London by a negro from Spain in the reign of Queen Mary. He died, however, without imparting the secret of his art, and it was lost until 1565, when it was recovered in the reign of Elizabeth, and Elias Growse, a German, taught the art to the English. The manufacture of needles was then again lost to England for nearly a century, but about 1650 it was recovered by Christopher Greening, who settled at Long Crendon, in Buckinghamshire.—London Chronicle.

THE ELECTRO-DYNAMIC MOTOR.

The strongest evidence of the advantages of the electric drive and its adaptability to textile requirements is its increasing use in textile mills. Among the latest and most adaptable of electric motors is the Inter-Pole motor made by the Electro-Dynamic Co. at its works in Bayonne, N. J. The introduction of this motor was received with much satisfaction by manufacturers and users. It is now used for the following drives: elevators, blowers, centrifugal pumps, laundry machinery, fans, textile machinery and a variety of other and varied classes of work.

There is no single feature claimed for this motor which will appeal more to users of textile machinery than that it is absolutely free from oil and sparking at the commutator. It is provided with the most approved and latest type of ball bearings, which require only bi-yearly attention (a little vaseline is the only lubricant), but enable several inches to be saved in the length of armature shaft and thus permit the motor to be installed in a smaller space than average motors of the same h. p. The builders state that a sparking limit of 100 per cent. overload has been designed, although numerous instances have been brought to their attention where a machine has been overloaded from 150 to 400 per cent. without being rendered inoperative. The gain in safety is apparent, and there is also a very material

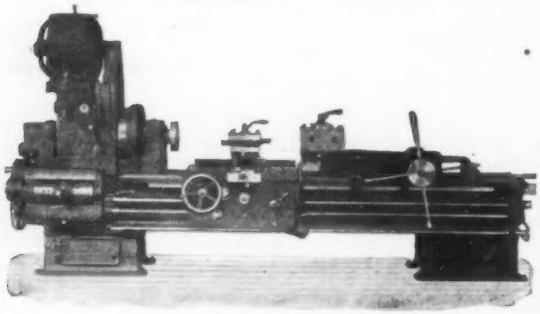
gain in maintenance due to the fact that owing to the absence of sparking, no attention to the commutator is required and the awkward necessity for stopping the motor, taking out the armature and repairing the



A VERTICAL MOTOR.

commutator, which very frequently happens, is avoided.

The greatest field for this motor has been in variable speed; speed variations are given from 2 to 1 up to 6 to 1 ratios, all on single standard voltage without auxiliary appli-



A HORIZONTAL MOTOR.

ances of any kind. The speed will remain constant at any point at which it is set and will not fall off, whether the motor is lightly loaded or heavily overloaded.

All these highly desirable results are brought about by the use of small auxiliary poles which are situated between the main poles of the motor and occupy space otherwise valueless. They are entirely independent of the main poles and whether the motor be lightly loaded or heavily overloaded, or reversed, operate in an equally positive manner.

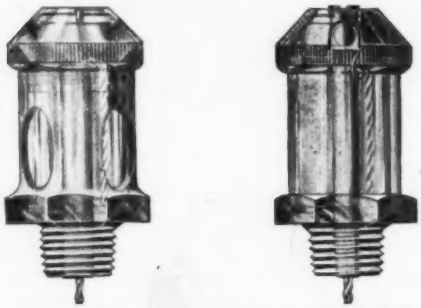
The machines are made vertical or horizontal and have other refinements, all of which are fully illustrated in the Electro-Dynamic Company's bulletins, which are sent on request.

The illustrations show up-to-date applications and illustrate the readiness with which the motor may be applied to various classes of machinery.

A NEW SIGHT FEED OIL CUP.

W. & C. F. Tucker, of Hartford, Conn., have perfected a new lubricator for small bearings supporting shafting running at high speed and needing constant lubrication. The cups are made in the protected glass form, style "A" and non-protected glass, style "B."

The cups have two ports which serve the



STYLE A—PROTECTED. STYLE B—NON-PROTECTED.

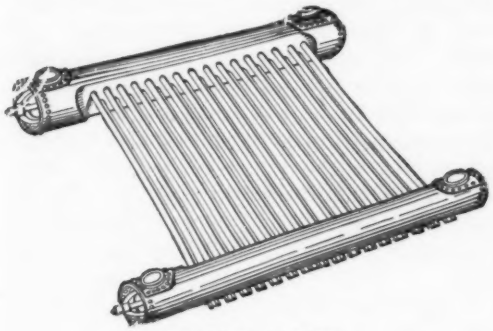
double purpose of making it handy to fill and permitting the escape of air when filling with oil. The feed is by capillary attraction.

The cloture or head cap is arranged with a positive stop and when turned in either direction against the stop the ports are closed and dust proof. The cups are made in four sizes from 9/16, 11/16, 13/16 and 15/16 hex. brass.

It was early prescribed in England that "woolen cloth, wherever it be made, shall be all of one breadth, two ells between the lists, and of the same goodness in the middle as on the edges."

THE HAWLEY DOWN DRAFT FURNACE.

On every hand we find the greatest efforts directed toward the prevention of waste in the care and operation of boilers. In the Hawley down draft furnace, built by the Glaser Mfg. Co., 2731-35 North 6th St., Philadelphia, there are two separate grates,

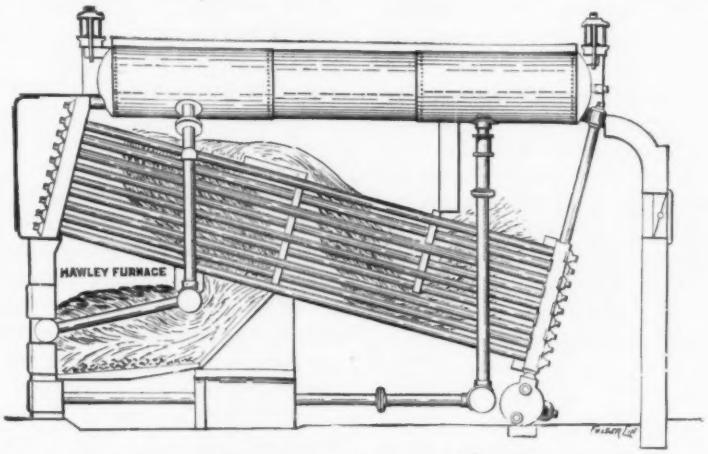


THE HAWLEY GRATE.

one above the other. The upper one is formed of a series of tubes opening at their ends into steel drums or heads, which in turn are connected with the boiler, through which the boiler water continually and rapidly circulates. It is this upper grate only that is fired. The down draft of air being passed from the upper fire doors, the gaseous matter from the coal consumed on the upper water tube grates is passed through this mass of fuel. What gases escape unconsumed are then burnt by the flame of the lower grate. The lower grate, formed of common bars, is fed entirely by the half-burnt fuel falling from the upper grate. As the flame from this source ascends, it meets the downward turning fire from the upper grate, and the joint draft current passes through the flues in the usual way. It is claimed that the furnace is made smokeless by this arrangement, with all the advantages of smoke consumption.

Among other claims is that the life of the boilers is increased by not opening the doors continually for firing, letting no cold air under the boilers to cause expansion and contraction; a small amount of ash because of the second grate; that the steam pressure can be held up with the upper grates during the clearing; that it will lessen from 30 to 45 pounds of coal per square foot of grate surface with good economy; that it will save from 10 to 40 per cent. in the cost of fuel; that it will increase the capacity of a boiler 50 per cent. above rated capacity with perfect safety and good economy of coal; that the repairs are very slight, much less than on any other furnace or stoker.

The Hawley furnace can be attached to any make of boilers, and will, it is claimed, prevent at least 95 per cent. of the smoke usually arising from bituminous coal.



THE HAWLEY DOWN-DRAFT FURNACE ATTACHED TO BABCOCK & WILCOX BOILER.

The Glaser Mfg. Co. will be pleased to give further information upon request.

Of the States in the cotton belt, Texas usually places the first bale of new cotton on the market and also produces the largest crop.

Dyeing, Bleaching, Printing, Etc.

DYEING WOOL, SILK AND COTTON FABRICS.

BY A. BUSCH, in Die Faerber Zeitung.

The dyeing of these fabrics may be divided as follows:—

1. The three combined fibres in union dyeing.

2. Wool and silk of the same color and cotton white or of a different color.

3. Wool dyed, silk and cotton white or of a different color, so that two and three colored effects are produced.

4. Cotton dyed, wool and silk white or of a different color, so that two or three colored effects are produced.

1. THE DYEING OF UNIONS.

The simplest method of dyeing unions consists in dyeing with substantive dyestuffs by themselves, or with the addition of wool colors used in a neutral bath. The whole manner of dyeing closely resembles the dyeing of half-woolens in a single bath, since a number of substantive dyestuffs, besides attracting color on wool and cotton, also attract at the same time on silk. But to obtain shades of the same intensity with these suitable dyestuffs, it is absolutely necessary to regulate accurately, within suitable limits, the temperature of the dye liquor. Cotton and silk take up the color best at a temperature of about 70 degrees C., while higher temperatures have a more beneficial effect on the development of the wool color. The method of dyeing is based on this behavior.

The bath is made up with dyestuff and with 10 to 30 per cent. Glauber's salt (cryst.) according to the depth of the shade required; immerse the goods at 50-60 degrees C., work for quarter of an hour, then gradually raise to boiling, boil for ten minutes, shut off steam and then allow to take up the dyestuff for half an hour at a falling temperature. Then it is matched off. The object of the short boiling is to cause the color to go on the wool, and the further filling of the cotton and silk is attained by working it for the half hour. Generally, it will be seen on matching that the wool is not as bright as the other fibres. To reduce the difference, it may be again boiled for a short time; it is better, however, to shade with wool colors used in a neutral bath. If boiling is preferred, it must be frequently matched off at short intervals, so as to shut off steam immediately the wool acquires a shade approaching the depth of the required shade. During the boiling the dyestuff more or less goes off the cotton and silk, and is taken up by the wool.

It is difficult to correct wool, the shade of which has turned out too dark, as substantive dyestuffs adhere to it very firmly; but this is not so in the case of cotton and silk, so that the stripping of these fibres presents much fewer difficulties. Strong stripping agents such as ammonia, soda, hydrosulphite, etc., are naturally not desirable. If, for instance, goods dyed with Benzo Pure Blue and Brilliant Wool Blue G extra are stripped with ammonia, the cotton becomes appreciably brighter, the silk almost quite white, but the wool is only slightly changed. Various wool colors used in a neutral bath can be stripped more easily than Brilliant Wool Blue G extra, yet the substantive dyed ground remains on the wool fibre.

From what has been said, it is seen that the dyeing of such fabrics is by no means easy, and to be certain of good results a fair amount of attention is required. A portion of those substantive dyestuffs which dye equally wool, silk and cotton under the above conditions are: Benzopurpurin 4B and 10B, Diamine Fast Red F, Benzo Fast Red FC, Benzo Fast Orange S, Congo Orange G, Diamine Green B, Benzo Green C, Benzo Dark Green B, Chrysophenine G, the Diazo Brilliant Scarlets and the Rosanthrenes (diazotized and developed with Developer A). The last named diazo colors are specially well adapted for this purpose. Dye only at about 80 degrees C., whereby the silk becomes at

first somewhat darker. After dyeing, wring, diazotize and develop.

The shades that are much in request can be produced with suitable mixtures of these dyestuffs.

The following wool colors used in a neutral bath are used for shading, especially when the fabric largely consists of wool: Formyl Blue B, Wool Blue N extra, R extra, SR extra, Brilliant Wool Blue B extra, G extra, Milling Yellow O, Sulphon Yellow 5G and R, Rhodamine B, Cloth Red 3G and 3B extra, Acid Anthracene Red G and 3B, Brilliant Milling Green B, Brilliant Acid Green 6B, Fast Green CR, Alkali Violet C and LR, Formyl Violet S4B, Acid Violet HW, Sulphoncyanine Black 2B, Naphthylamine Black 4B and 6B.

Suitable combinations are:

Rose color.....	0.2%	Brilliant Geranine 3B.
	0.02%	Rhodamine B.
Bright Bordeaux..	2%	Benzo Fast Scarlet GS.
	2%	Acid Anthracene Red 3B.
Coffee Brown	3%	Diamine Brown M.
	1%	Milling Yellow O.
	0.6%	Acid Anthracine Red G.
	0.4%	Formyl Blue B.
Yellow	2.5%	Chloramine Yellow HW.
	1.5%	Sulphon Yellow R.
Canary Green....	2%	Chloramine Yellow M.
	2.2%	Diamine Pure Blue FF.
	0.1%	Brilliant Wool Blue G extra.
Medium Blue	2%	Benzo Pure Blue.
	0.75%	Formyl Blue B.
Marine	1%	Sulphocyanine GR extra.
	4%	Diazo Black BHN.
Black.....	3%	Direct Deep Black RW extra.
	3%	Naphthylamine Black 4B.

For Black, the following is also suitable:

3%	Pluto Black BS extra.
3%	Sulphoncyanine Black 2B.

Combined recipes are combinations of substantive and wool colors used in a neutral bath, according to the amount of wool, silk or cotton in the fabric, more or less of one or the other classes of dyestuff is used; for silk, the wool colors are of first consideration.

2. WOOL AND SILK DYED THE SAME AND COTTON WHITE OR OF A DIFFERENT COLOR.

The choice of dyestuffs suitable for the production of the above style is not great, for those which leave the cotton quite white, mostly dye the silk less than the wool. To obtain the cotton quite white, a long boiling of the dye liquor is often necessary, yet even then, too much dyestuff is boiled off from the silk. Still there are dyestuffs which yield satisfactory results by using the following recipe: The bath is made up of 20 per cent. Glauber's salt, 2 to 3 per cent. acetic acid, or 1 to 2 per cent. sulphuric acid, immerse at 50 degrees C., slowly warm to 90 degrees C., work for about half an hour, and exhaust the bath by a further addition of acid. If the wool is not dark enough it may be boiled for a short time. The method of exhausting the liquor by a further addition of acid and in this way also to obtain the wool sufficiently covered is, however, mostly preferred to boiling, because in this way the color is not stripped from the silk. The treatment varies naturally from case to case, and the dyer must find for himself which is the most serviceable.

The following colors are suitable: Milling Yellow O, Sulphon Yellow 5G and R, Quinolin Yellow, Acid, Anthracene Red G and 3B, Brilliant Wool Blue G extra, Formyl Blue B, Alizarin Astrol B, Brilliant Milling Green B, Brilliant Acid Green 6B.

To obtain now two colored effects, the cotton is covered in a cold or lukewarm bath, with the addition of about 10 per cent. Marseilles soap and 1 to 2 per cent. soda ash.

For an accurate description of the dyeing of cotton with substantive colors see under 4a. The difference between covering and bottoming is that in the first method a lower temperature must be used, so that the dyestuff is not stripped from the wool and silk.

As examples the following may be mentioned: Wool and silk dyed blue with 3 per cent. Formyl Blue B. Cotton golden yellow, topped with 2 per cent. Direct Yellow R. Wool and silk dyed green with 1.5 per cent. Brilliant Acid Green 6B. Cotton Red topped with 3 per cent. Benzo Fast Scarlet GS. Wool and silk dyed red with 2 per cent. Acid Anthracene Red 3B. Cotton medium blue topped with 2 per cent. Brilliant Benzo Blue 6B or Diamine Pure Blue. By mixing with Chloramine Yellow GG, the last named blue is converted into greenish shades.

A not quite pure white on cotton, but one which is suitable for topping on darker shades, is obtained when wool and silk are dyed with the following dyestuffs under the conditions given above: Brilliant Croceine 3B, Sulphoncyanine GR extra, Wool Blue N extra, R extra, SR extra, Sulphoncyanine

Black 2B, Alkali Violet C, LR. Formyl Violet S4B and Acid Violet 4B extra.

3. WOOL DYED, SILK AND COTTON WHITE OR OF A DIFFERENT COLOR, SO THAT TWO OR THREE COLORED EFFECTS ARE PRODUCED.

Although silk only seldom remains a quite pure white, still it is not difficult to obtain satisfactory results if the right dyestuffs are used; it may be mentioned that silk freed from the raw material gives good effects, while that containing any raw silk does not yield good results.

The material is dyed in a large excess of dye-liquor (1:100), 10 per cent. acetic acid is added, immerse at 50 degrees C., heat to boiling, boil vigorously and add gradually 10 per cent. acetic acid.

The following dyestuffs are suitable for this purpose: Azo Fuchsine G, 6B, Azo Grenadine S, Sorbin Red, Azo Phloxine 2G, Azo Orseille, Fast Yellow extra, Fast Light Yellow 2G, 3G, Tartrazine, Flavazine, Naphthol Yellow S, Victoria Violet 4BS, Alizarin Saphirol B, Napthol Green B, Acid Chrome Black WS (after chromed), etc. For the topping of cotton, to produce two colored effects see under 2; all the substantive colors mentioned under 4a are especially suitable.

Three colored effects are obtained by dyeing the silk in presence of acetic acid with acid dyestuffs, which dye well at a low temperature, after topping the cotton. Acid dyestuffs which only dye at high temperatures are to be avoided, because they would naturally dye the wool too deep a shade. Basic colors also cannot be applied, because they dye well on cotton and especially so if it is already bottomed with other dyestuffs; accordingly in dyeing silk with basic colors the cotton would change its original shade more or less. The silk is dyed at a temperature not above 30 to 35 degrees C., with the addition of 6 to 8 per cent. acetic acid.

Suitable dyestuffs are: Azo Grenadine S, Naphthol Red O, Azo Red G, Victoria Scarlet 2R, Indian Yellow G, Brilliant Acid Green 6B, Acid Green GG, Alkali Fast Green B, Brilliant Wool Blue G extra, Alizarin Astrol B, Naphthalene Blue B, Formyl Violet 10B, Fast Acid Violet 10B.

All the dyestuffs named dye the wool to a certain extent by the process, although only slightly, so that in dyeing in this way no essential change takes place, especially if care be taken in bottoming the wool.

By care in dyeing is understood that if the wool is first dyed, for example, blue, and the silk topped with a red, the blue will appear brighter and greener than it really should. The topping of the silk causes a deficient red shade. In this case the wool might well take a redder shade by raising the temperature of the bath while dyeing the silk; this process is, however, very risky, and requires, at least, matching repeatedly, as the dyestuff on the cotton may be easily stripped on account of the high temperature of the liquor.

If the wool is previously dyed red and the silk topped with a blue, the red will naturally remain very bright, as the blue color on the silk causes a dulled effect.

Example: Wool, dyed red with Azo Grenadine S; cotton, bluish grey with Diazo Black BHN; silk, green with Acid Green GG extra and Indian Yellow G.

4. COTTON DYED, WOOL AND SILK WHITE AND OF A DIFFERENT COLOR.

It seldom happens that wool and silk remain white, but they are frequently topped. For colors produced in this way, the cotton only serves for the ground color, and hence chiefly in dark shades, while the wool is dyed with the same or a different color and the silk serves as an effect. This happens when, for example, the fabric consists of cotton warp and woolen weft and silk effects are woven in the warp or even in the weft.

To dye the cotton first, two methods may be used: (a) With substantive colors, (b) with sulphide colors.

(a) In dyeing with substantive colors add 10 per cent. Marseilles soap, 1.5 to 3 per cent. soda ash.

Dye at 50 degrees C. for 1 to 1 1/2 hours. The addition of soap and soda, as well as the comparatively low temperature, are used with the object of keeping off the color from the wool and silk fibres; at the same time the low temperature is also of benefit, in that the wool and silk are scarcely affected at all, owing to their resistance, in dyeing with an alkaline bath. Glauber's salt should not be added

since it increases the attraction of the silk and wool for the dyestuff.

For dyeing the cotton the following dyestuffs are suitable: Chloramine Yellow GG, Direct Yellow R, Diamine Fast Yellow B, Chloramine Orange G, Benzo Fast Scarlet 4BS, 5BS, 8BS, GS, Diazo Black BHN direct or developed with Developer A and H, Benzo Blue 2B, Zambesi Blue BX, Benzo Chrome Blue Black B, Diamineral Blue R, Benzo Pure Blue, Diamine Pure Blue, Brilliant Benzo Blue 6B, Pluto Black G (for grey), etc.

The topping of the wool takes place with the three wool colors mentioned below, and especially if the silk is to remain white, in a boiling hot and strongly acid bath. In this case, the dyestuffs used for dyeing cotton must naturally possess sufficient fastness to acids and must not boil off on dyeing at a high temperature. Hence most of the above-mentioned substantive colors are far from suitable, since they are mostly boiled off from the cotton by the acids, combined with the high temperature of dyeing, and bleed into the other fibres. If it were possible to dye at low temperatures and with the addition of only a little acid, then they would apparently all be suitable.

For topping in a hot and strongly acid bath use: Diazo Black BHN, which gives with Developer A a dark blue, with Developers A and F blue-black, and with Developer H a deep black; Pluto Black G as grey and Benzo Chrome Dark Blue as blue or greyish blue.

For example, dye the cotton a bluish grey with 3 per cent. Benzo Chrome Dark Blue and then the wool a red.

If the silk is also to be dyed, the process given under 3 is employed and the dyestuffs mentioned are used.

(b) The dyeing of the cotton with sulphide colors.

If the fabric is dyed so as to obtain two and three-colored effects, then the sulphide colors offer far more security for the permanency of the dyestuff on the cotton than the direct colors. Most of the sulphide colors are very fast to acids and topping and are not boiled off in dyeing hot (in topping the wool or silk). The various fashionable shades such as olive, brown, green, blue and black can be produced.

In order not to injure the wool and silk fibres in dyeing the cotton in an alkaline bath, the dyeing takes place at low temperatures, with the least possible quantities of sodium sulphide and soda. The attraction of the silk fibre for the sulphide color is quite removed by the addition of glue or casein. But whereas in dyeing the cotton with substantive colors, the wool is scarcely colored, in dyeing, however, with sulphide colors this takes place to a certain extent.

In spite of the wool being colored to some extent, still the application of sulphide colors for effects of this kind is of great value, because the color on the cotton becomes distinctly faster to light and wearing.

The manner in which the dyebath is prepared for sulphide colors should be known, but a few recipes may be mentioned:

Black, calculated for weight of liquor.

8/10	per cent.	Katigen Black TG extra.
1 2/10	per cent.	Sodium sulphide (cryst.)
4/10	per cent.	Soda ash.
2	per cent.	Common salt.
2	per cent.	Casein.

Blue.

2/10	per cent.	Immedial Blue CR.
2/10	per cent.	Katigen Chrome Blue 5G.
4/10	per cent.	Sodium sulphide.
2/10	per cent.	Soda ash.
1	per cent.	Blue or casein.
3	per cent.	Potassium bichromate.
3	per cent.	Copper sulphate.
5	per cent.	Acetic Acid.

After dyeing it is well washed and then worked for half an hour at 90 degrees C. in the given metallic salts, calculated on the weight of the goods. In dyeing according to the above two recipes, the wool takes up too much sulphide color and hence shows no serviceable shade and must on that account be topped.

Casein is made into a paste with a little water, and then enough cold water is added till a dilute solution is obtained. Then it is warmed up and 5 per cent. ammonia is added, so that the solution becomes slimy; this is then added to the dyebath.

Glue is allowed to swell in cold water and then it is boiled up. The process of working with glue is patented by the firm of Cas-

sella & Co., and that with casein by Fr. Bayer & Co.

The following sulphur colors are suitable: Immedial Black NNR conc., NT, Katigen Black NWR extra, T extra, Sulphur Black T extra, Thiogen Black MR conc., N, Katigen Marine Blue R extra, Katigen Brown 2R, V extra, Katigen Dark Brown B extra conc., N extra conc., R extra conc., Immedial Dark Brown D extra, Katigen Yellow Brown GG, GR extra, Immedial Bronze A, Pyrogene Brown D, V, Thiogene Brown R, Sulphur Catechu G.

Mercerized cotton requires less substantive or sulphide color and also exhausts the bath more rapidly. From this it is clear that if the fabric contains mercerized cotton, the wool and silk must become brighter and whiter, because the amount of dyestuff which they find in the liquor is less in quantity and is more quickly taken up by the cotton.

On that account many classes of goods, chiefly those with cotton warp, are treated with soda lye before dyeing (similar to the mercerizing process). To prevent any injurious effect of the soda lye on the wool and silk, glycerine is added, and after the treatment with acetic acid it is soured off. The most suitable fabrics for dyeing with sulphide colors are those containing coarser wools, since softer wools may be injured, in spite of the addition of casein or glue.

A WARP DYEING MACHINE.

The dyeing machine shown in the accompanying illustrations has recently been patented in the United States and is designed for a large production, reduced tension on the warp, thorough oxidation, regular temperature and uniform shades. It is adapted for a wide range of colors and is said to be comparatively inexpensive. Fig. 1 is a side elevation; Fig. 2, a front view; Fig. 3, a top view; Fig. 4, a section on the line 44 of Fig. 2.

The machine is provided with a combined warp drawing and compressing device arranged at one side, and is mounted upon a platform, which projects part way over the top. The platform is supported by a supporting-frame. The combined warp drawing and compressing device consists of upper and lower compressor rolls, which are mounted in bearing-standards, one roll being retained in close proximity to the other by a counterweighted lever, which bears upon the shaft of the upper roll. The shaft of the lower roll is geared with a driving device of any suitable construction. Upon the platform at the front of the lower roll is arranged a suspension device, carrying a guiding-eye for the warp as it leaves the lower reel. The guiding-eye is preferably constructed of porcelain. The rolls perform two functions. They not only draw off or cause the reeling off of the warp from the reels, but also squeeze the

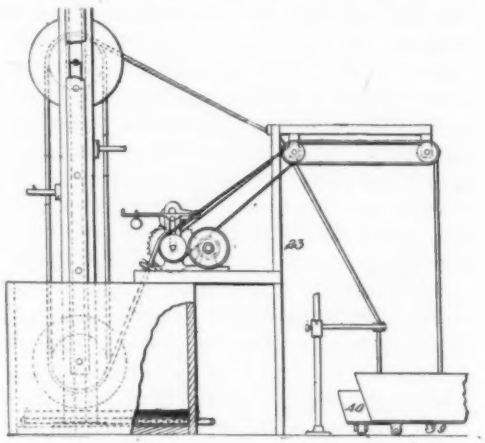


FIG. 1.

warp, so as to remove the dye liquor, and the surplus liquor is discharged back into the receptacle. The platform is formed of two separate sections suitably spaced so that the surplus dye liquor when pressed from the warp will fall into the receptacle. Arranged in suitable relation with the combined warp drawing and compressing device is a pair of conveyer-rolls, carried by a pair of suspension-arms supported by the frame. The rolls are arranged a suitable distance above the combined warp drawing and compressing device and are connected together by the endless band so as to cause them to rotate together. Arranged below the rolls is a receiving-tank, which is mounted upon a transferring-truck.

There is a truck for the warp to be dyed, and when the machine is in operation the

truck is placed at the front. An adjustable guide for the warp as it leaves the truck is provided. This guide consists of a base, carrying an upwardly-extending rod, upon which is mounted an arm provided with an adjustable collar to permit of vertically adjusting the arm upon the rod.

As the warp leaves the truck the arm is lowered. Another warp-guide is provided,

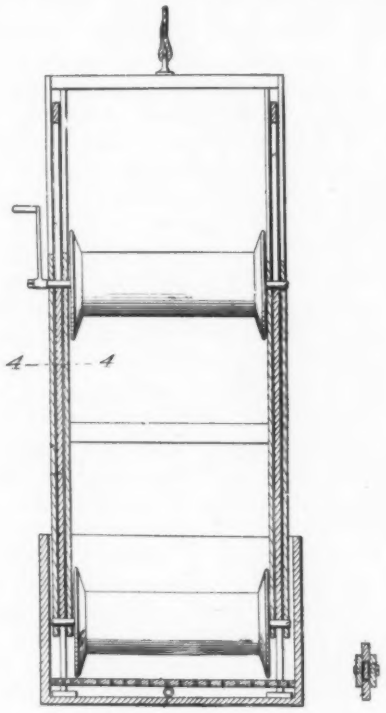


FIG. 2. FIG. 4.

which consists of a bar having an eye. The bar is arranged at the front of the machine below the reel when the latter is in its operative position. The eye tends to guide the warp upon the reel at one side as the warp enters the machine to be dyed.

The operation of the machine is as follows: A leader is passed through the eye, and the reels and are suitably filled with the leader. The proper spacing of the leader is obtained through the medium of the guide-pins. This operation is done when the reels are elevated, so as to be out of the receptacle. The rolls are then lowered, so that the reel will be within the receptacle. The warp to be dyed is connected to one end of the leader and the other end of the leader is passed between the compressor rolls.

The filling of the reels with the leader is done by means of a crank. The dye liquor is then run into the receptacle and retained at its proper temperature. The combined warp drawing and compressing device is then operated, which, as it draws the leader, will cause the reels to turn and the rolls will press the liquid out of the warp into the receptacle. As the warp leaves the rolls it will be carried up and discharged into the other receptacle.

One of the advantages of such a dyeing-machine is that when dyeing with sulphur colors from one to two hundred feet of the warp is in the dye vat at one time. By the

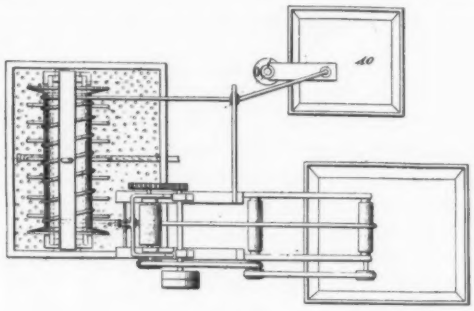


FIG. 3.

employment of the reels, one of which is immersed in the dye liquor, the warp travels around the reels eight or more times and passes in and out of the dye liquor, and as the warp is raised high in the air it will oxidize before the dye liquor is pressed out, thereby giving the coloring matter time to fix properly before being exposed to the air, prevent too sudden surplus precipitation, and produce deep jet blacks in two or three runs.

Another advantage of the machine is that a regular temperature of the dye bath is maintained without injury to the warp, thereby producing colors at less cost. Another advantage is that the tension upon the warp is reduced to a minimum. Consequently when the warp leaves the dyeing machine it is soft and elastic. A further advantage is that the compressor rolls are not arranged within the dye liquor receptacle, and consequently the reels can be removed when occasion requires, and, furthermore, as

the reels are constructed of wood and have the guide-pins co-operating therewith, warps, breaks and tangles are prevented.

The exact quantity of water and dyestuff is not so essential, as none of the coloring-matter is precipitated and thrown down. Thus it is claimed that when operating upon the warp, glossy blacks are obtained with great saving in both dyestuffs and labor. The dye bath is easily kept in solution, producing even shades and overcoming the great difficulty in matching one warp with another. In this particular it is only necessary to observe the per cent. of dyestuff for each hundred pounds of warp, the quality of water not being considered at all.

CHROME POISONING.

BY WESSEX.

Something may now be added to my article on Chrome Poisoning in English Dyeworks, which appeared in the September issue of the Textile World Record. Apparently some, like Mr. Daniel J. Carey of Waltham, Mass., found difficulty in believing the condition as serious as had been stated. That gentleman protested that the government should interfere. It can now be said that the state has intervened, for a memorandum by the chief inspector of factories has been issued, which contains matter of importance to dyers everywhere. Be it said that chrome poisoning is less frequent where weak solutions, as in slub dyeing, are used and most common when stronger mixtures are employed. For instance, aniline-black workers have been especially afflicted, although few large dye houses have no victims of chrome to show. Matters are nearly as bad in Germany, and no doubt American dyers will be glad to prevent mischief in their own works.

The document in point is the outcome of official inquiries recently conducted, and it confirms previous accounts by saying that chromic acid attacks the skins of some people much more readily than others. Its characteristic effects are the causing of pimples, which occur usually about the folds, joints, knuckles of the hand, the wrist or forearm. These assume the dimensions of a rash and if neglected and allowed to come into constant contact with chrome, the papules burst and leave the chromic ulcerated condition so often found.

As the report says, these ulcers may penetrate to the bone, lead to loss of nails or deformation of joints. That the ultimate consequences have been much more disastrous to susceptible persons is well known in the British dye-works. Those who handle crystals of bichromate and see to their boiling are especially liable to the unpleasantness of a corrosion of the septum of the nose. It is fair to say that in this respect dyers' men have come off more happily than the operatives of the chemical works producing bi chromate in this country.

Of 82 persons examined by a medical inspector of the home office, who are employed in chroming, washing and drying aniline blacks, 11 (or 14 per cent.) showed traces of past or present poisoning by chrome, 16 (or 20 per cent.) showed marked pallor and 28 (or 34 per cent.) showed pale, grey or blue lips. Of 60 persons examined, employed in seven factories, and engaged in mixing, preparing and ageing, 28 showed unnaturally colored lips, 34 characteristic pallor and five had scars, the result of injury by chrome.

In these cases chrome poisoning blends with poison by aniline oil and the pair together are as mischievous as could well be. It is aniline oil—in the language of the report—which causes "coloration of the lips, distention of small veins and paleness," which outward signs are accompanied by "headache, dizziness, feeble heart action, drowsiness and difficulty in breathing." As the consequence of upsetting a carboy of acid into the mixing tank, "complete unconsciousness, paralysis of movement and of senses may supervene;" while gastric disturbance, distaste for food and so forth are the regular portion of those who have been long at the work.

Hence it is recommended, and will probably be made compulsory, to install exhaust ventilation over each preparing machine, at the point where dust is produced in chroming, at the "ager," and where aniline black goods are steamed. Meal-rooms and clothes

rooms and proper accommodation are to be provided and no person with any rash or ulcer on his hands should be allowed to handle bichromate in any form. Furthermore, those handling chrome crystals or ladling out the prepared aniline liquor are required to wear rubber gloves. In a suggested notice to workmen it is stated that broken chrome sores are almost certain to lead to incapacity and that the effects of aniline poisoning are intensified by alcoholic indulgences.

The memorandum, despite its strictly official and dispassionate terms, ought to be enough to warn anyone from underrating the special perils of dyeing. It has nothing to say, although something might well be said by those in authority, concerning the use of lead in finishing works, which also is provocation of physical harm.

Chlorine was first used as a bleaching agent in 1786 by Berthollet. About twelve years later chloride of lime came into use.

AN IMPROVED JIGGER.

In this machine, recently patented in the United States, the dye liquor is forced, in the form of a spray, against the moving cloth. The inventors claim that the machine is much more convenient, as no storage tank above the jigger is required. They also claim that the difficulty with shading from side to centre, so frequently arising with jigger-dyed goods, is obviated by the new apparatus.

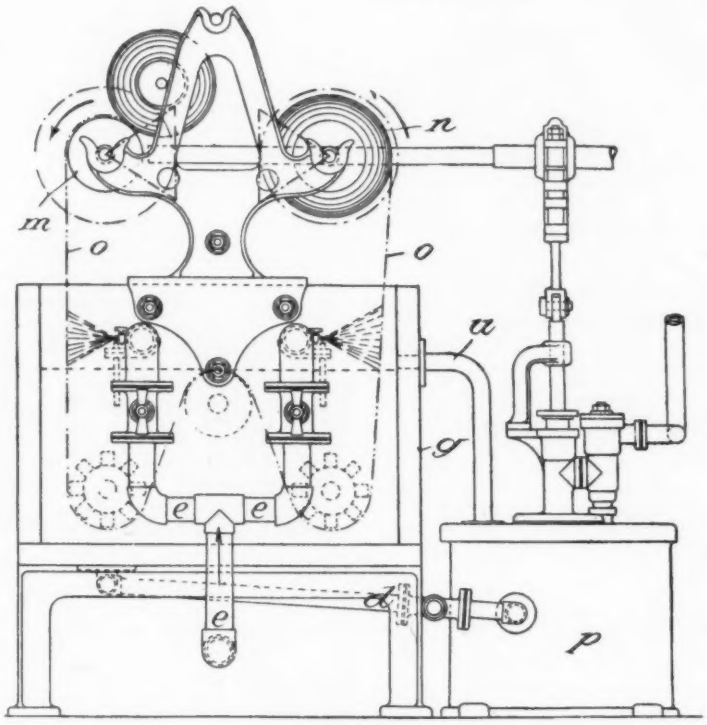


FIG. 1.

Fig. 1 is an elevation of the entire machine, and Fig. 2 a vertical section through the vat and principal parts of the mechanism. Fig. 3 is a plan of a portion of the apparatus, showing the arrangement of the nozzles.

The dye of the desired color is prepared in the vat, g, and is forced against the fabric, o, under treatment by means of the nozzles, a b. The fabric unwinds from the roller, m, and winds on to the roller, n. The vat is provided with an outlet, c, out of which the waste dye liquor runs through the pipe, u, to the pump, p, whence it is again forced through the pipe,

d, into the vat again. This continuous circulation of the liquor insures much more thorough utilization than otherwise is the case.

The aperture, c, may be located at any suitable height and, if desired, fitted with a stop-cock.

The aperture, s, at the bottom of the dye-vat is adapted to receive a discharge-cock, so that after dyeing the liquor may be run off. By means of the pipe, e, air is fed to the pipes, f, carrying the suction-pipes and nozzles, a and b, regulated by means of small cocks. The latter should be opened more or less, depending upon the width of the goods being dyed.

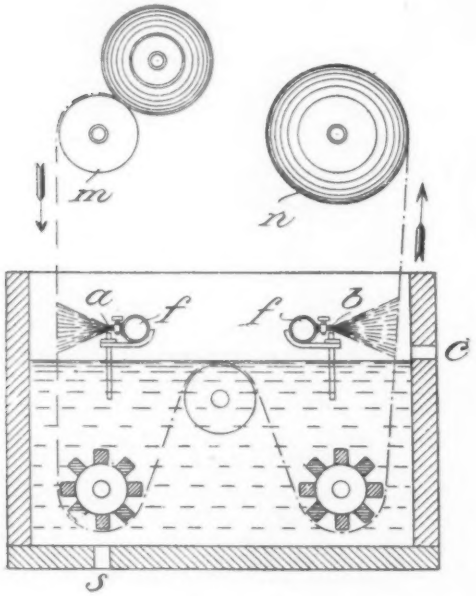


FIG. 1.

CORRECTION.

In the December issue, Dye Recipe No. 180, the 1/2 lb. Thioflavine T should have been marked as from Cassella Color Co. This color was applied on yarn mordanted with Thos. Leyland's sumac. The recipe for mordanting should have been No. 185 instead of No. 95.

A CLOTH LUSTERING MACHINE.

The process of imparting a high silk-like lustre to cotton and other goods by pressing the fabric between finely corrugated rolls has been in successful use in Europe for some time and the patents protecting it have been the subject of considerable litigation between rival claimants. Recently an improvement on this process has been patented in Germany by Joseph Eck and Son, Dusseldorf, and apparently is worthy of more than passing notice. The improvement consists in the shape of the corrugations of the press rolls. These are in the form of slightly inclined surfaces of suitable size and separated by smaller and more sharply inclined surfaces. It is claimed that by pressing the cloth with the roller thus corrugated the surface of the fabric is made to reflect a larger number of rays of light and that thus a higher lustre is obtained. The larger the number of corrugations the higher the lustre. If there are 250 corrugations per inch there will be 62,500 points in a square inch. This number can be increased if desired.

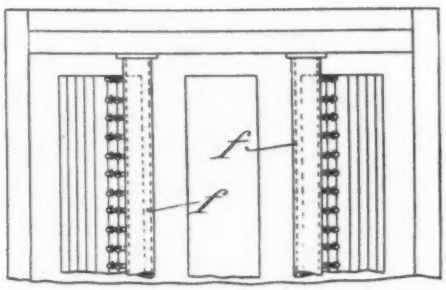


FIG. 2.

Fig. 1 shows the construction of a press cylinder used for this finish. Owing to the minute size of the corrugations they cannot be shown in the illustration. Figs. 2 and 3 show the corrugated surface on an enlarged scale. The form of the indentations can be

Fig. 1.

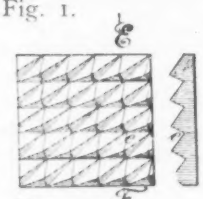


Fig. 2.

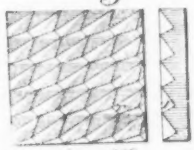


Fig. 3.

varied by making them either triangular, circular, in the form of ellipses or polygons. Each projection, however, must have its sides inclined at various degrees. (Translated by the Textile World Record from Leipziger Monatschrift fuer Textil-Industrie.)

New Color Cards.

Printing Immedial Colors in Dark Shades; Cassella Color Co., New York.

A folder showing twelve samples of cotton piece goods printed with various immedial shades, for which full directions are given.

Anthracene Blues; Cassella Color Co., New York City.

A card showing twenty samples of slubbing, woolen yarn and woolen piece goods dyed with Anthracene Acid Blue 2 G and 2 R and Anthracene Chrome Blue F D.

Xylene Blue; Walter F. Sykes & Co., New York.

A folder with nine samples of woolen cloth and nine of worsted yarns showing 1 and 2 per cent. dyeings of Xylene Blue A S, B S and V S. Full working directions are given.

Chlorazol Brilliant Blue; Read Holliday & Sons, New York City.

Circular No. 27 shows seven shades of cotton yarn and four of cotton piece goods, dyed with different percentages of Chlorazol Brilliant Blue 10 B and 12 B respectively.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation Subscription price for the Dyers' Supplement $1.00 per year

Recipe No. 1.

Brown on Cotton Yarn.

Columbia Brown M on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Columbia Brown M.
(Berlin Aniline Works, 215 Water St., New York.)
½ lb. Soda Ash.
30 lbs. Common Salt.

Dye at a boil for one hour, then after treat for ½ hour in a bath containing

1 lb. Potassium Bichromate,
3 lbs. Copper Sulphate,
1 lb. Acetic Acid.

Columbia Brown M gives an excellent shade of brown, possessing excellent fastness.

Recipe No. 2.

Brown on Union Cloth.

Columbia Brown M on 100 lbs. cotton and wool union cloth. Prepare the dye bath with

3 lbs. Columbia Brown M.
(Berlin Aniline Works, 215 Water St., New York.)
20 lbs. Glauber's Salt.

Enter at 180° F and dye at a boil for one hour.

Columbia Brown M is especially adapted to the dyeing of cotton and wool union goods.

Recipe No. 3.

Blue on Cotton Yarn.

Chlorazol Brilliant Blue 12 B on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Chlorazol Brilliant Blue 12 B.
(Read Holliday & Sons, 7 Platt St., New York City.)
5 lbs. Common Salt.

or

20 lbs. Common Salt

if a heavy shade is required.

In cop dyeing the color solution should be filtered through a cloth before being circulated through the machine.

Chlorazol Brilliant Blue 12 B gives a splendid white with a hydrosulphite or chlorate discharge.

Recipe No. 4.

Hematine Crystals on Chrome Mordant.

First mordant the yarn in a bath made up with

3 lbs. Potassium Bichromate

and

2 lbs. Lactic Acid,

entering at 140° and mordanting for 1½ hours at a boiling temperature.

When mordanted dye in a bath containing

5 lbs. Hematine Crystals,
(Thos. Leyland & Co., 53 India St., Boston)

entering at 140° F and dyeing at a boil for 1 to 1½ hours.

Hematine Crystals will be found to possess excellent solubility and high coloring power.

Recipe No. 5.

Blue on Cotton Yarn.

Chlorazol Brilliant Blue 10 B on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Chlorazol Brilliant Blue 10 B,
(Read Holliday & Sons, New York City.)
5 lbs. Common Salt,

or

20 lbs. Common Salt

if a heavy shade is required.

In cop dyeing the color solution should be filtered through a cloth before being circulated through the machine.

Chlorazol Brilliant Blue 10 B gives a splendid white with a hydrosulphite or chlorate discharge.

Recipe No. 6.

Yellow on Cotton Yarn.

Thiazole Yellow G L on 100 lbs. cotton yarn. Prepare the dye bath with

1 lb. Thiazole Yellow G L.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
2 lbs. Soda Ash.
40 lbs. Glauber's Salt.

Enter at 180° F., bring to a boil, and after fifteen minutes shut off the heat and dye for ¾ of an hour in the gradually cooling bath.

Thiazole Yellow G L dyes level, is very soluble and is especially adapted to the dyeing of clear shades of yellow on cotton yarn and piece goods.

Recipe No. 7.

Brown on Cotton Yarn.

Tetrazo Brown L R H on 100 lbs. cotton yarn. Prepare the dye bath with

4 lbs. Tetrazo Brown L R H.
(American Dyewood Co., 156 William St., New York.)
1½ lbs. Soda Ash.
30 lbs. Common Salt.

Enter at 180° F. and dye at a boil for one hour. Fuller and brighter shades result if the material is steeped in the dye bath for 15 minutes after shutting off the steam.

Tetrazo Brown L R H will be found valuable in the direct dyeing of all forms of cotton material.

Recipe No. 8.

Brown on Woolen Cloth.

Compound shade on 100 lbs. woolen cloth. Prepare the dyestuff mixture with

50 parts Acid Yellow G A.
18 parts Fast Acid Green O.
18 parts Fast Acid Red E R.
(C. Bischoff & Co., 88 Park Pl., New York.)
14 parts Reduction.

Prepare the dye bath with

6 lbs. of the above mixture.
20 lbs. Glauber's Salt.

Enter the cloth at 140° F., dye at a boil for ½ hour, then add

1 lb. Sulphuric Acid,

boil 15 minutes longer and then gradually exhaust the bath by the addition of

3 lbs. Sulphuric Acid.

The above mixture gives an excellent shade of brown of good fastness.

Recipe No. 9.

Pink on Worsted Yarn.

Rhodamine G on 100 lbs. worsted yarn. Prepare the dye bath with

1½ lbs. Rhodamine G.
(Edwin M. Thayer & Co., 411 Atlantic Ave., Boston, Mass.)
10 lbs. Common Salt.
3 lbs. Acetic Acid.

Enter goods at 140° F., dye at a boil for one hour. The dye bath can be completely exhausted by the addition of a small quantity of acetic acid.

Rhodamine G gives an excellent pink upon woolen and worsted material of every variety.

Recipe No. 10.

Yellow on Worsted Yarn.

Chrome Yellow D. F. on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Chrome Yellow D F.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
15 lbs. Glauber's Salt.
3 to 4 lbs. Acetic Acid.

Enter yarn at 140° F., boil one hour, or until bath is exhausted, then cool bath somewhat and add

1½ lbs. Potassium Bichromate

and boil ¾ of an hour longer.

Chrome Yellow D F gives shades of yellow possessing a clear tone and good fastness to milling. It will be found a valuable color in the production of compound shades.

Recipe No. 11.

Brown on Cotton Yarn.

Thiogene Catechu R on 100 lbs. cotton yarn. Prepare the dye bath with

15 lbs. Thiogene Catechu R.
(H. A. Metz & Co., 122 Hudson St., New York.)
25 lbs. Sodium Sulphide Crystals.
5 lbs. Soda Ash.
40 lbs. Common Salt.

Enter at just below the boil and dye at a boiling temperature for about one hour.

Thiogene Catechu R possesses excellent solubility and very good fastness.

Recipe No. 12.

Blue on Worsted Yarn.

Azo Chrome Blue T B on 100 lbs. worsted yarn. Prepare the dye bath with

3½ lbs. Azo Chrome Blue T B.
(Cassella Color Co., 182 Front St., New York.)
20 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter the yarn at 120° F., raise slowly to the boil and continue the boiling for about one hour, or until the dye bath is exhausted.

Then add

2¼ lbs. Potassium Bichromate,
1 lb. Sulphuric Acid,

and develop the blue by boiling for one hour.

Azo Chrome Blue T B possesses very good fastness to light, alkalies, stoving, carbonizing and washing.

Recipe No. 13.

Blue on Worsted Yarn.

Azo Chrome Blue T on 100 lbs. worsted yarn. Prepare the dye bath with

3½ lbs. Azo Chrome Blue T.
(Cassella Color Co., 182 Front St., New York.)
20 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter yarn at 120° F., raise slowly to the boil and continue the boiling for about one hour, or until the dye bath is exhausted.

Then add

2¼ lbs. Potassium Bichromate,
1 lb. Sulphuric Acid,

and develop the blue by boiling for one hour.

Azo Chrome Blue T possesses very good fastness to light, alkalies, stoving, carbonizing and washing.

Recipe No. 14.

Brown on Woolen Cloth.

Compound shade on 100 lbs. woolen cloth. Prepare the dyestuff mixture as follows:

50 parts Acid Yellow G A.
18 parts Fast Acid Green O.
24 parts Fast Acid Red E R.
(C. Bischoff & Co., 88 Park Pl., New York.)
8 parts Reduction.

Prepare the dye bath with

4 lbs. of the above mixture.
20 lbs. Glauber's Salt.

Enter the cloth at 140° F., dye at a boil for ½ hour, then add

1 lb. Sulphuric Acid,

boil 15 minutes longer and then gradually exhaust the bath by the addition of

3 lbs. Sulphuric Acid.

The above mixture gives an excellent shade of brown of good fastness.

Recipe No. 15.

Yellow on Cotton Yarn.

Mercaptol Yellow G on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Mercaptol Yellow G.
(Walter F. Sykes & Co., 85 Water St., New York.)
5 lbs. Sodium Sulphide Crystals.
5 lbs. Soda Ash.
40 lbs. Common Salt.

Dissolve the color and sodium sulphide separately and add to the bath to which the soda ash has already been added. Then add the common salt and proceed with the dyeing as usual for sulphur colors.

Mercaptol Yellow G is a new sulphur color which produces shades of remarkable fastness to scouring and light.

Recipe No. 16.

Brown on Cotton Yarn.

Tetrazo Brown D B H on 100 lbs. cotton yarn. Prepare the dye bath with

4 lbs. Tetrazo Brown D B H.
(American Dyewood Co., 156 William St., New York.)
1½ lbs. Soda Ash.
30 lbs. Common Salt.

Enter at 180° F. and dye at a boil for one hour. Fuller and brighter shades result if the material is steeped in the dye bath for fifteen minutes after shutting off the steam.

Tetrazo Brown D B H will be found valuable in the direct dyeing of all forms of cotton material.

Mill News.

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the Textile Advance News, issued weekly by the publishers of the Textile World Record, at $15.00 per year.

COTTON.

New Mills.

*Connecticut, Plainfield. The contract for building the new plant for the Lawton Manufacturing Company calls for completion of the buildings about the middle of July, and work will start at once by A. N. Carpenter (Norwich) by whom contract was secured.

*Georgia, Comer. Work will start in March on erection of the new mill to be built and operated at this place by the Mallison Braided Cord Co., of Athens, of which L. F. Edwards is treasurer. They will equip same with from 3,000 to 5,000 spindles for making 8 to 12, 3 or 4 ply yarns. They will develop 500 h. p. water.

*Georgia, La Grange. C. V. Truitt is president of the Elm City Cotton Mills Co., recently reported incorporated. J. G. Truitt, vice-president; Fuller E. Callaway, treasurer, and Roy Dallis, secretary and manager.

*Massachusetts, Fall River. The new mill of the Fall River Iron Works Co. is known as Mill No. 7, is about ready to start up and it is expected that parts will be put in operation within two weeks.

*Massachusetts, Westboro. J. S. Mason is operating 9 looms on narrow fabrics, tapes, etc. The plant will have a total equipment of 24 looms, additional ones to be installed during December.

*North Carolina, Belmont. It is reported that work will soon start on construction of the new Imperial Yarn Mill, which is reported to be completed and ready for operations January 1, 1907. E. C. Lineberger is president of the new company; D. E. Rhyne, vice-president, and R. L. Stowe, secretary and treasurer.

North Carolina, Concord. A weave mill, with equipment of 40 looms, for making quilting, is soon to be started here by J. W. Odell.

*North Carolina, Concord. The Brown Manufacturing Company contemplates starting the new mill about January 15th, making 3-yard sheeting. This company is capitalized at $100,000; C. W. Johnston, president; E. F. White, treasurer and A. H. Harwell, superintendent. Will operate 7,600 ring spindles and 200 looms, using electricity.

*North Carolina, Gastonia. The Gray Manufacturing Company, capitalized at $175,000, contemplates starting their new mill about January, 1906. This company, which has placed contracts for all machinery and supplies, will make yarns, numbers from 40s to 80s, single and ply, cones and tubes, with an equipment of 10,240 ring spindles.

*North Carolina, Greensboro. The Pomona Cotton Manufacturing Co. is now installing the machinery and expects to start up about Feb. 15th or March 1st, with 10,751 spindles and 330 wide plain looms making sheeting and drills.

*North Carolina, Monroe. The Icemanlee Cotton Mills have been organized with cash capital of $110,000. W. S. Lee is president of the new corporation; James H. Lee, vice-president and Chas. Iceman, general manager. They propose manufacturing coarse yarns. A new building, about 280 by 70 feet, will be built and some 50 tenements for the operatives.

*North Carolina, Mt. Holly. It is expected that all arrangements will be completed by the first of the year for building the new plant to be operated as the Woodlawn Cotton Mills. This concern, which will be capitalized at $80,000, with privilege of increasing to $150,000, will equip the mill with 5,000 spindles.

Pennsylvania, Philadelphia. The Bellevue Mills Co., with a capital of $200,000, has just been incorporated in Camden, N. J. The incorporators are: George C. Turner, superintendent of the Lincoln Mfg. Co., Chester, Pa., manufacturers of cotton yarns; Robert J. McKeown, of the firm of N. P. Sloan & Co., dealers in cotton, Third and Chestnut Sts., Philadelphia, and Wilfred B. Walcott, Esq., of Camden, N. J. The charter calls for the manufacture of any or all kinds of textiles. The first meeting of the company will be held the first week in January after which they will be able to state where the new mill will be located and what class of goods are to be manufactured.

Pennsylvania, Philadelphia. Baxter, Kelly & Foust have started up a plant with 10 looms for the manufacture of cotton plushes for the undertaking trade, in the Bromley Mill at the N. E. corner of Jasper and York Streets. Mr. William H. Foust is the superintendent and buyer. The main office of the company is at 496 Broome Street, New York. They are buying 16 single, 30 two-ply and 14s filling.

*South Carolina, Pacolet. The Pacolet Mfg. Co. has started rebuilding one of the mills destroyed by the flood in 1903 and contemplates having same completed about March. About 500 people will be employed.

*Tennessee, Bemis. Work is nearing completion on the new building for the Bemis Bag Co. As the machinery arrives it is being placed in position and the additional machinery, 22,000 spindles and 800 looms, will soon be in operation.

Enlargements and Improvements.

Alabama, Piedmont. The Coosa Mfg. Co. is reported as making arrangements for installing additional machinery in Mill No. 1, including 13,000 spindles. They have recently completed installation of additional machinery in Mill No. 2 and now operate a total of 27,000 spindles.

Connecticut, New London. Work has been started on erection of a new brick addition to the Palmer Bros. Co.'s mill.

*Georgia, Lindale. The Massachusetts Mills in Georgia are installing 1,036 new automatic Draper looms with Roper heads.

Georgia, Newnan. The Newnan Cotton Mills held meeting recently and voted to increase the capital stock. They will build a new mill, which will have an equipment of about 20,000 spindles.

Massachusetts, Adams. The Berkshire Cotton Company will remodel one of their storehouses for a weave shed and will install additional looms.

*Massachusetts, East Webster. Two new boilers are being put in the Slater Cambric Works.

Massachusetts, Fall River. The Laurel Lake Mills are to replace 11 pairs of mules with ring spinning frames (about 11,000 spindles.)

Massachusetts, Globe Village. Extensive changes are being planned at the Hamilton Mills, in which the room now occupied by the burling department, which will be removed to the "Print works" building, will be equipped with additional looms.

*Massachusetts, Griswoldville. The Griswoldville Manufacturing Co. has completed the large addition to the bleachery.

Massachusetts, Lawrence. An extension is underway to Wm. and Chas. Beck's mill in which they will install additional looms.

Massachusetts, Thorndike. The Thorndike Co. is installing 38 new (Northrop) looms in No. 2 Mill.

Massachusetts, Webster. A new boiler and engine is being put in S. Slater & Sons' mill.

Mississippi, Laurel. The Laurel Cotton Mills will make additions to the mill and will install 8,500 new spindles and preparatory machinery.

*North Carolina, Lincolnton. The Daniel Mfg. Co. has completed installation of the 2,100 spindles reported to be installed last August.

New Hampshire, Manchester. The Amoskeag Corporation will build an annex, 200 by 100 feet, one story, brick and stone, to the present building for increasing dye house facilities.

*New York, New York Mills. Work has begun roofing-in the new addition to the corduroy department of Mill No. 3. It is expected that the machinery will be installed within two weeks.

North Carolina, Asheville. The Asheville Cotton Mills are now being operated by electricity.

*North Carolina, Lumberton. The Lumberton Cotton Mills expect to start up their new mill, under construction, with 6,000 spindles, early in 1906. A new engine and generator will be installed for furnishing power.

Pennsylvania, Clifton Heights. The Colonial Manufacturing Co., manufacturers of Turkish towels, tidies and table covers, both printed and plain, report a very active business at this time. They have recently enlarged the plant by putting up additions to the main building, consisting of wings on each end which they are using for bleach houses, drying rooms, offices and stock rooms. They have also put in many looms, the number run by them now being 30, which will be increased as soon as the main building is enlarged, which will be about one-half, to give them more room for new machinery. The goods are sold direct.

*Rhode Island, North Smithfield. Contract has been let for the erection of the new storehouse for the Blackstone Mfg. Co. This building will be 300 by 80 feet, one story.

South Carolina, Gaffney. The Limestone Manufacturing Co. is to erect an additional building, 225 by 100 feet, and will install about 12,000 new spindles and 300 looms.

South Carolina, Columbia. The Olympia Mills are enlarging the smoke stack at the power house by addition of 70 feet and adding a fuel economizer. Several changes are also being made to the fire pumps. It is expected that all changes will be complete about March.

South Carolina, Columbia. A heating plant is being installed in the Granby Mills. One-half the floor space in the mill's avenue store is being converted into a ware house for cotton and cotton goods.

South Carolina, Union. At special meeting held recently by stockholders of the Aetna Mills, the capital stock was increased from $200,000 to $350,000, divided equally between common and preferred stock. W. H. Sarter was re-elected president.

Tennessee, Knoxville. Contract has been let for erection of a mixing house and spooler house for the Brookside Mills.

Texas, Waxahachie. At a recent meeting of the directors of the Waxahachie Cotton Mills, it was voted to make additions and improvements to the plant and plans and specifications are being prepared. They are to increase facilities for manufacturing from 5,000 to 6,000 bales of cotton per year, at present consuming about 3,000. Additional cottages will also be built.

Mills Starting Up.

*North Carolina, Stanley. Operations are to start this month in the Carpenter Manufacturing Company's new cotton batting mill.

*Texas, Denison. The Denison Cotton Mill Co. has started the plant with an equipment of 8,000 spindles. The company expects to add about $5,000 worth more of spindles within the next three months and later on will probably install about 300 looms.

WOOLEN.

New Mills.

*Massachusetts, Easthampton. C. H. Johnson is president of the National Felt Co., C. E. Sturtevant, agent, and Wm. Taylor, superintendent. Operations will be started December 15th, making felts. A dye house will be attached. Product will be sold direct.

*Massachusetts, Hudson. The property of the old Hudson Blanket Co. has been purchased by J. J. Hennessey, treasurer of the Thos. Kelly Co., Boston, Mass., and will be put in operation as soon as possible. A fine line of bed blankets will be made and the plant operated to its full capacity.

*Massachusetts, Monson. Operations will start in February in the Field Worsted Mill, G. W. Field, proprietor. This plant will have equipment of 12 looms for making men's wear, worsted and cotton worsteds.

*New Jersey, Camden. The machinery consisting of 3 cards and 3 combs recently delivered by Arthur Stead, Philadelphia, to Eavenson & Levering, scourers, burrers and carbonizers of wool, to be operated as a commission combing plant, is now being set up and is expected to be in operation around the first of the year.

Pennsylvania, Philadelphia. William J. Erskine is one of the new manufacturers recently starting in business in this city manufacturing ingrain carpets on 16 looms and is located on the first floor of the Davenport Mills, Mascher, below York Sts. Mr. Erskine reports that business with him is good.

*Rhode Island, Ashaway. The Progress Worsted Mills, capitalized at $25,000, will start operations in one month, with equipment of 2 sets cards and 24 looms, making fine worsted cloths. A dye house will be attached to plant.

*West Virginia, Guzeman. Work will start at once on rebuilding the Englehart Woolen Mill Co.'s mill destroyed by fire recently. This company is capitalized at $30,000, with James B. Kelly, president; O. C. Crane, treasurer, and J. M. Englehart, agent, superintendent and buyer. It is expected to have the plant ready to resume operations May 1st, with an equipment of 2 sets cards and 14 broad looms, with dye house attached, making woolens, flannels, ladies' skirts, blankets, etc. Are in the market for all the equipment.

Enlargements and Improvements.

Connecticut, Mechanicsville. The mill at this place is running in full. They have received 25 of the 50 new (Crompton & Thayer) looms. Will have a total of 125 when installation has been completed. They are also putting in a new electrical plant, for which wiring is nearly complete.

*Connecticut, Rockville. The Hockanum Co. has completed erection of their new four-story mill.

Connecticut, Stafford Springs. Contract has been let for erection of an addition to the Fabyan Mill.

*Maine, Dexter. The Morrison Woolen Company is installing a new 200 h. p. engine in the Whitin Mill, which will render the plant independent of water power.

*Massachusetts, Lowell. The new spinning mill being erected by the Bigelow Carpet Co., on site of an old mill, is being roofed in. This building will be 225 by 123 feet, seven stories. They do not propose making any radical increase in the machinery at the present time.

*Massachusetts, Lowell. The Musketaquid Mills, recently reported having leased the Nesmith Mill, will install 30 new looms in the building. This concern manufactures fine fancy worsteds and dress goods.

Massachusetts, Maynard. The Assabet Mills have installed three additional sets of large cards in the plant, giving them a total of 98.

Massachusetts, Maynard. The American Woolen Company is erecting a storehouse at the Assabet Mills, 100 by 50 feet, five stories.

*Massachusetts, Medway. The Medway Woolen Co. is installing new looms in the weave room.

*Massachusetts, Monson. A new boiler has been received at the Somerset Worsted Company's mill and will be set up at once.

Massachusetts, North Andover. The Brightwood Manufacturing Company is to erect a new dye house next spring.

*Massachusetts, Uxbridge. The C. A. Root Company is installing a new fire sprinkler in their new addition and have already placed 10 of the new looms in position. As the machines are received they are set up and put in operation. When they complete additions they will have total of 60 looms.

New Hampshire, Claremont. A new set of cards is to be installed in A. Roberts & Co.'s mill and a new mule. A new dam is under construction which will increase motive power with 400 more h. p.

New Hampshire, Newport. Dexter Richards & Sons Co. have just finished their new mill, built on site of the old plant. Three new sets of cards have been installed, 13 finisher cards and 16 double apron condenser. Work is now underway on setting up five new mules.

New Hampshire, Rochester. The Rochester Woolen Company has installed new machinery in the plant during the past week.

New Hampshire, Tilton. An addition is being built to the Elm Mills Woolen Co.'s plant for purpose of enlarging the dye house.

*New Jersey, Passaic. The Pitkin-Holdsworth Worsted Co. is completing a new mill at this place and will remove the machinery equipment at the New York plant, operated as the Manhattan Worsted Mills, to this place. They will install new machinery and other new equipment.

*New Jersey, Passaic. The Pitkin-Holdsworth Worsted Co., which is erecting a new plant, will have a total equipment of 16 combs, 17 worsted cards and 9,500 worsted spindles when completed. This company manufactures worsted yarns up to 32s.

New Jersey, Somerville. The Somerville Manufacturing Co. is installing six more sets of cards to the plant. This will give them a total of 14 sets. They contemplate adding about 35 more looms.

*New York, Albany. Wm. Barnet & Son expect to have the new addition to the building which they will occupy completed by July 1st. New machinery will be installed.

Pennsylvania, Philadelphia. H. C. Ball & Co., Main Street and Shurs Lane, Manayunk, have given out a contract for a five story addition to their mill, the dimensions of which are 44 by 108 feet.

*Pennsylvania, Philadelphia. The Shetland Worsted Mills, Wakefield and Ashmead Sts., Germantown, have ordered a number of new looms from the Crompton-Thayer Co., on which they will manufacture fancy woolens. They are very busy and as soon as the new looms are installed a larger force of weavers will be employed.

Pennsylvania, Philadelphia. The Rhodesia Manufacturing Co. is to increase capacity of the plant by installation of 12 new looms.

Rhode Island, Woonsocket. The Lafayette Worsted Company is to build a large addition to the mill, which will greatly increase capacity of the plant.

*Tennessee, Cleveland. Fire destroyed the card and spinning room of the Cleveland Woolen Mills on May 28th, and work was started immediately on rebuilding, and at this time they have about completed a four-story building, 300 by 60 feet. Their specialty is a "Dollar Pant," which is produced from the output of the mill, which is cassimeres. Will employ about 700 people when running to full capacity, 2,500 pants per day. Goods are sold direct to the trade.

Virginia, Winchester. An additional building is to be erected by the Virginia Woolen Company. They will install new machinery to increase present capacity of the plant.

Mills Starting Up.

*Connecticut, Baltic. Operations have been resumed in the Shetucket Worsted Mills, which have been closed for purpose of installing a new water wheel.

*Maine, Kezar Falls. Operations have been resumed in the woolen mills after months of idleness, during which time repairs and improvements have been made to the mill.

Maine, West Buxton. C. E. Manock, who has been superintendent for the past 15 years for the R. W. Lord Co., Kennebunk, Me., has resigned to go into business for himself. He has opened the Hargraves mill at West Buxton, Me., and will manufacture blankets, etc.

*Massachusetts, Westboro. The Westboro Mills, which have begun operations in the Westboro Carpet Co.'s plant, is capitalized at $62,000, with Louis Dusenbury, president, and Wm. Jas. Hogg, treasurer. As previously reported will make carriage, velvet and tapestry carpets, operating 26 looms.

Mills Shutting Down.

Ontario, Seaforth. The Seaforth Woolen Mills, John Dick, Ltd., proprietors, have been closed for an indefinite time. It is not known when operations will be resumed.

For Knitting Mill News, see Knitting Department.

SILK.

New Mills.

*New York, Canisteo. The Canisteo Silk Company is capitalized at $30,000 and has equipped new plant with 12,000 spindles for throwing silk. P. Huguet is president of the company and manager, and F. P. Merrill, treasurer. About 75 people will be employed.

*New Jersey, Passaic. The Alexander Company has been incorporated with capital stock of $35,000; Alexander C. Huber is president and Hugh B. Dickinson, treasurer of the company. They have started operations, making fancy vestings and dress fabrics, operating 8 broad and 50 narrow looms. Goods are sold direct. Mr. Huber attends to the buying.

*Pennsylvania, Allentown. The Unity Silk Manufacturing Co., with a capital of $100,000, and the following officers: president, Wm. Yeager; treasurer, Leo. Schimpff and Geo. Bitzer, superintendent and buyer; have recently started up 60 looms on which they are making broad silks and selling through New York. The motive power used to operate the mill is water. The mill is located in South Allentown.

*Pennsylvania, Bangor. The Bangor Silk Co., of which J. Ruskin Jones is superintendent, advises us that they will start operations within a month.

Pennsylvania, Lehighton. Emanuel Cochran and Pierce Rehrig, of this place, are reported as interested in locating a silk mill at this place and have leased a three story brick building for the purpose.

Pennsylvania, Mt. Carmel. A. & H. Levy, New York, are to be the proprietors of the new silk mill reported to be established here. The main building will be 200 by 50 feet, two stories, brick, with separate boiler house, engine room, etc. It is reported that construction work will start not later than March 1st and be completed in not more than 90 days.

Rhode Island Pawtucket. William W. Harrison, formerly operating a plant at Central Falls, has discontinued same at that place and is now interested in the Imperial Silk Mills Co., with factory and office at Charlton Avenue, where plant has been greatly enlarged. They will manufacture only the highest grade of goods, the "Imperial Silk," "Imperial Henriettas," and "Imperial Cashmeres."

Rhode Island, River Point. The old Pike planing mill at this place has been leased by parties who will equip same with about 50 looms for weaving fancy silks. Geo. F. Wright will be superintendent and manager for the new concern. Repairs and alterations are being made to the buildings.

Enlargements and Improvements.

New Jersey, Paterson. The Victory Silk Co. will increase the capacity of the plant by installation of additional looms, increasing to 200.

New Jersey, Paterson. The Brilliant Silk Company has secured option on a large tract of land on Totowa Avenue, upon which it is proposed to erect a large mill, more than double the present size.

New York, Fonda. The Dexter Manufacturing Co., Fort Hunter, has purchased the Cushney storehouse and will remodel same. It is expected to have the building ready for operations about

January 1st, when the Fort Hunter mill will be discontinued.

*New York, Saratoga Springs. The Clark Textile Co., which is erecting a new silk mill at this place, will not discontinue the other plants as was recently reported.

Pennsylvania, Allentown. The Palace Ribbon Mfg. Co., with 15,000 spindles and 126 looms in full operation, report business as good. It is their intention to have erected a new addition, 42 by 72 feet, to be used as a silk finishing and throwing plant. They will also put in 2,000 more spindles. John Graeflin is the superintendent and buyer.

Pennsylvania, Allentown. The Lecha Silk Co., manufacturers of ribbons on 28 looms at 310 N. 12th St., have started up a branch plant with 22 looms in the new mill occupied by the Unity Silk Co., in South Allentown.

Pennsylvania, Allentown. The Weilbacher Silk Mill Co. has placed order for fifty additional ribbon looms which will be installed as soon as possible.

Pennsylvania, Hazleton. It is reported that L. Roessel & Co. will make enlargements to the silk mill at this place.

Pennsylvania, Philadelphia. The Sauquoit Silk Mills have been granted a permit for the erection of a new dye house 48 by 69 feet, to be used as an addition to the dye house now used by them. Building will be pushed forward to completion as fast as possible.

Pennsylvania, Philadelphia. Plans have been completed for a new three-story addition, 50 by 80 feet, to the factory of Horace Linton & Bro., 3061 to 3081 Ruth St. They manufacture silk and cotton narrow fabrics and cigar ribbons on 44 looms, the plant being run by electricity and the product sold direct.

Pennsylvania, Philadelphia. It is reported that the J. B. Stetson Co. will erect a silk weaving plant adjoining its present mill, on Cadwallader St.

*Pennsylvania, Scranton. Operations will start Feb. 1st by the Sauquoit Silk Mfg. Co. in their branch mill to be established here for making yarns.

*Pennsylvania, Slatington. The Post & Sheldon Corporation, late of Paterson, N. J., who recently took over the plant formerly occupied by the defunct Slatington Textile Mfg. Co., are erecting a three-story brick addition to the main building to be used as a weave shed and in which they will install 150 looms and which they expect to have finished and the looms in operation by Feb. 1st. The company has 300 looms in operation in the old plant on broad silks, the looms in the new building to be run on the same class of goods. The superintendent and buyer is J. P. Gordon.

Mills Shutting Down.

Pennsylvania, South Bethlehem. The L. C. Hohrath Co., manufacturers of ribbons and trimmings, whose mill has been closed for several months, has gone out of business and the machinery has been sold.

MISCELLANEOUS.

Delaware, Wilmington. The American Fabric Improvement Co., whose business will consist of treating finished textile fabrics, has just been incorporated with a capital of $250,000. The incorporators are all located in Wilmington.

*Massachusetts, Barrowsville. The Barrowsville Bleachery, which was reported to be started during October, will not begin until about the middle of this month, owing to delay in completing the electric light plant.

*Massachusetts, Millbury. The United States Linen Company, which is to install an up-to-date linen finishing and bleaching plant, contemplates having same complete about February 1st.

Massachusetts, Newton. The Nonantum Worsted Co.'s plant was damaged by fire quite recently. The loss is estimated at about $15,000.

*New Jersey, Wortendyke. The Granite Linen Company, which has started rebuilding the plant destroyed by fire, contemplates having same in operation by February, '06, with new equipment of 2,000 flax spindles and 250 looms. This company is capitalized at $200,000; John G. Elliott is president; F. A. Schwartz, treasurer, Frank Woodhead, agent and H. A. Woodhead, superintendent. Mill is now being operated in temporary quarters.

New York, College Point. A new building, two stories, upon which work has begun on foundations, will be built for Rudolph Weber.

*Pennsylvania, Allentown. The Liberty Silk Dyeing are removing their entire plant from Paterson, N. J., to their new location in South Allentown. The fast black department is already in operation while the color departments are expected to be put in operation within a few days. The company has a capital of $300,000 and the following officers: President, Geo. W. Cole, Jr.; treasurer, Chas. P. Cole; secretary, Wm. S. Cole.

Pennsylvania, Allentown. Messrs. Pickup & Keen on Sumner Ave., near 5th St., are very busy dyeing cotton skein yarns. They have recently put in a new 2,000 lb. dryer from the American Drying Mch. Co. and a new dynamo.

Pennsylvania, Allentown. During the early part of the coming year Lotte Bros. & Co. will increase their large silk dye house by putting up two new additions, one and two stories high, of brick. It is their intention, if possible, to have them finished by Feb. 1st.

Pennsylvania, Philadelphia. The Richmond Dye Works, Howard & Thompson Sts., dyers and bleachers of cotton yarn, hosiery, mercerized yarn and artificial silk, in addition to the 18 h. p. boiler now in use in their plant are installing a new 40 h. p. boiler. The plant has been shut down for two or three days to enable them to make this change, but as they have large orders on hand it will be started up at once.

Rhode Island, Drownville. The Frost Finishing Company is a new concern which has been incorporated recently with capital stock of $100,000 for bleaching, dyeing and finishing cotton and other fabrics. Geo. B. Frost, J. W. Bishop and F. G.

Anderson are among those interested. A new building, 150 by 50 feet, one story will be built.

*Vermont, Rutland. The Rubbernit Waterproofing Co. has been organized here with C. L. Stewart, superintendent. This refers to the project mentioned last January, that C. L. Stewart, inventor of a waterproofing cloth, was interested organizing a company.

*Washington, Chehalis. The American Flax Fibre Company has started operating their new plant making flax fibre, long line and tow. This company is capitalized at $250,000. Theo. Poindexter, president; Fred A. Greenwood, treasurer, and Geo. E. Nolan, manager.

FIRES.

Connecticut, Turnerville. E. W. Turner & Co.'s silk mill at this place has been destroyed by fire. The loss, principally on the machinery, is placed at about $10,000.

Georgia, Rome. The Rome Hosiery Mill has been totally destroyed by fire. The loss, estimated at $25,000, is partially covered by insurance. At meeting held by the stockholders it was voted to rebuild the mill, and it is expected that work will start within 60 days.

Massachusetts, Fall River. The American Linen Mill was damaged recently by fire, which started in the No. 1 mill. The loss is estimated at about $3,000. Mill has been closed for purpose of making repairs.

Massachusetts, Pittsfield. Fire which started in the picker house of Davis & Mahoney's plant caused loss of some $20,000 to the plants occupying the building, viz., Davies & Mahoney, Musgrove Knitting Co., J. C. Purnell. The companies all carried insurance and as soon as losses are adjusted operations will be resumed.

New Hampshire, Dover. Fire which started in the bleachery and singeing departments of the Cocheco Mills caused damage of about $10,000 to the plant. A large quantity of unfinished stock was destroyed and the building damaged.

New Jersey, Paterson. About $5,000 damage was done to the Johnson & Cowdin Silk Mill by explosion of a gasolene tank.

New Jersey, Paterson. The silk mill operated by Peter Kempkes has been destroyed by fire. The loss, estimated at $10,000, is partly covered by insurance.

New York, Broadalbin. The Broadalbin Knitting Mill has been destroyed by fire. The loss on building, machinery and stock is estimated at $110,000, about three-fourths of which is covered by insurance. It is thought that the plant will be rebuilt at once.

Vermont, Pownal. The Pownal Mill of the Wright's Health Underwear Company has been destroyed by fire. The loss is placed at about $150,000. Arrangements have been made whereby the employes will be employed in the Troy plant until some decision is made regarding the rebuilding of the Pownal Mill.

FAILURES AND SUSPENSIONS.

Pennsylvania, Philadelphia. Thomas H. Bromley has been appointed receiver in bankruptcy for the Durham Carpet Company. The security has been fixed at $25,000. The Durham Carpet Company was started up here about two years ago at 189 Oxford Street, by William F. Hogg, with 12 looms on which they manufactured body Brussels and Wilton carpets.

Vermont, Brattleboro. Charles H. Thompson, president of the Brattleboro Manufacturing Company, has filed a voluntary petition in bankruptcy, giving liabilities at $101,557 and assets of $18,435.

FACTS AND GOSSIP.

Alabama, Columbiana. It is reported that a knitting mill is proposed at this place and that a Mr. Mathison of Talladega is interested.

Alabama, Talladega. We have been advised by G. A. Mattison of the Talladega Oil Mill Co. that they are contemplating establishing a plant here for manufacturing rope from low grade cotton.

*California, Marysville. After due repairs have been made to the mill, the Marysville Woolen Mills, recently secured by the Stockton Woolen Mills, will resume operations. E. J. Goodpastor will have charge.

Canada, Montreal. The Colonial Bleaching & Printing Co.'s mill is now under control of the Dominion Textile Co., Ltd., Colonial Branch.

*Connecticut, East Willington. The Connecticut Woolen Mills Co. has been incorporated with capital stock of $50,000. S. S. Welch has been appointed manager of the plant. New machinery has been installed and various other repairs made and it is expected that operations will soon begin.

Connecticut, Gurleyville. Charles Farwell has purchased P. G. Hanks' interest in the silk mill.

*Connecticut, Rockville. We have been advised by the Messrs. Maxwell that they have not yet made any plans regarding the Warp Mills recently purchased, but it is probable that they will equip same as a woolen and worsted weaving plant.

*Connecticut, Stafford Springs. The A. B. Paton Manufacturing Co. has been incorporated with capital stock of $75,000 to continue the Central Woolen Company's plant. J. H. Paton (Newtonville), A. B. Paton and A. M. Paton (Ware) are the incorporators

*Connecticut, Turnerville. The P. W. Turner & Co.'s plant, recently destroyed by fire, will not be rebuilt at present.

*Delaware, New Castle. The Fort Casimir Woolen Mills are reported to resume operations about the first of February. Men's wear will be made.

Georgia, Calhoun. It is reported that preliminary steps have been taken toward establishing a cotton mill at this place and active work will soon start soliciting subscriptions.

Georgia, Lafayette. The hosiery mill will be offered at public sale Tuesday, Dec. 5th, by Jas. P. Shattuck and P. D. Fortune, receivers.

Georgia, McDonough. H. B. Neal, E. M. Copeland and others are reported interested in a project under way for establishing a cotton factory here. It is proposed to organize a company with capital stock of $200,000 and work has been started soliciting subscription.

Iowa, Lake Mills. It is reported that Chicago capitalists are interested in rebuilding the Lake Mills Woolen Mills, recently destroyed by fire.

*Louisiana, New Orleans. The Lane-Maginnis Mills Corporation has been organized with capital stock of $1,600,000. S. Odenheimer is president of the company, and Geo. A. Hero, treasurer. The combined equipment is 84,000 ring spindles and 2,400 looms. Product is sold direct.

*Maine, Richmond. F. J. Chaplin (Boston), previously reported as having purchased the Kennebec Spinning Mills for $33,000, represents the first mortgage bondholders. The next highest bid for the property was $32,000.

*Massachusetts, Adams. W. B. Orr, mentioned as interested in the Adams Woolen Co., has retired from that company and will devote his entire time to the Renfrew Mfg. Co., of which he is manager.

*Massachusetts, Boston. The Anchor Knitting Company, reported incorporated last February, has ceased to do business.

Massachusetts, Chicopee. The Dwight Manufacturing Co. is reported as contemplating a two-story brick addition to the mill.

Massachusetts, Clinton. The Nashua Valley Mills have started operating the plant nights.

*Massachusetts, Hudson. Work will start shortly on the erection of the new buildings for the Direct Corehair Co.

Massachusetts, Lowell. The Advance Manufacturing Company has been incorporated with capital stock of $20,000 by Sidney Martin, Bertram T. Martin and Horace Martin. They propose making web goods.

Massachusetts, Monson. The Field Worsted Mill has been organized by G. W. Field and a plant will be built on site of plant destroyed by fire. Worsted and cotton worsted goods for men's wear will be made. Mr. Field was formerly with the Jessee Eddy Mfg. Co., Fall River, and Sayles & Jenks Mfg. Co., Warren.

Massachusetts, North Andover. Sutton's Mills have been incorporated recently with William Sutton, president, and Harry Sutton, secretary.

Massachusetts, North Easton. It is reported that the Cox factory has been purchased by Wm. H. Harris of Boston and that he proposes starting a worsted spinning mill in same.

Massachusetts, Palmer. Arrangements have been completed by the Grosvenor Woolen Company for operating the plant 24 hours daily. Mr. E. G. Gibson will have charge of the night work.

*Massachusetts, Pittsfield. It is rumored that Davies & Mahoney, whose plant was recently damaged by fire, are to locate elsewhere. It is also reported that they have been looking over the Bel Air mill with intention of starting there.

*Massachusetts, Pittsfield. The Airedale Mills Company, Inc., has been incorporated with capital stock of $200,000 to continue the plant of the Helliwell Company. B. G. A. Rosentwist is president of the company; Arthur Merritt, treasurer, and E. Wiessner, superintendent. Work will start shortly on erection of a new engine room and power plant.

*Massachusetts, Spencer. At meeting held recently of the creditors of the Spencer Woolen Company, Arthur Monroe was made trustee. The meeting was adjourned to Jan. 25th.

*Massachusetts, Spencer. It is reported that the J. F. Wicks mill is being started up on cotton warp goods. G. M. Stoddard is also interested in the plant.

*Massachusetts, Springfield. The Hutchins Narrow Fabric Co.'s mill has been sold at private sale to the Brooks Bank Note Paper Co.

Massachusetts, Williamstown. It is reported that the Boston Finishing Works are to be closed permanently owing to depression of business and other less important reasons.

Michigan, Detroit. M. W. Edgar has been elected president and general manager of the Pioneer Woolen Mills.

*Mississippi, Meridian. The proposed plant for the Beatrice Cotton Mills has been postponed.

*New Hampshire, Manchester. At the recent meeting of the stockholders of the Amoskeag Manufacturing Company it was voted to purchase the Amory and Manchester properties. The price to be paid for the Manchester plant is $3,500,000 and for the Amory $1,575,000. Should the stockholders of the Amory or Manchester Mills desire to continue their interest in the business, provision is made by which each share of the Amory will give the holder right to invest $150 in certificates of the Amoskeag at the rate of $200 per share and the Manchester Mills, each share (both common and preferred) entitles the shareholder to privilege of investing $100 in the same way, the certificates to be converted into Amoskeag stock when legislative authority to issue additional stock is granted.

New Hampshire, North Salem. It is reported that the Wheeler mill will be put in full operation about the first of January, making blankets.

New Jersey, Bound Brook. The Bound Brook Woolen Mills have been turned over to a stock company by H. L. Einstein, the former proprietor. A company has been organized with Henry L. Einstein, president; William Einstein, secretary, and David Hastings, treasurer.

*New Jersey, Bridgeton. The Martin Dyeing & Finishing Co., reported incorporated at this place, will not start before spring.

*New Jersey, Fairview. The project of establishing a bleachery here is again being agitated. B. T. Ward and Harry Beecher with Geo. Van Kueren are mentioned as actively interested.

New Jersey, Newton. It is reported that Moses & Wacker, 876 Broadway, New York, manufacturers of silk embroideries, have completed negotiations with the Board of Trade, whereby they will remove their plant here.

Personals.

R. D. Kitchens, formerly overseer of weaving at the Monarch Cotton Mill, Union, S. C., has accepted a similar position in the Loray Cotton Mill, Gastonia, N. C.

Geo. W. Kendry, overseer of weaving at the American Felt Co., Glenville, Conn., has resigned.

Fred Cook, who has been boss weaver at Nasonville, R. I., for some time, has resigned to take the position left vacant by Wm. Rider at the Earnscliffe Mills. Mr. Cook's place has been filled by John Quinn, who was boss weaver at the National and Providence Mills many years. Joseph Chambers has been promoted to Mr. Quinn's place.

J. L. Cobb has resigned his position as overseer of weaving at the Irene Mills, Gaffney, S. C.

Peter Reil, formerly loom fixer at the Lebanon Mills (N. H.), is now overseer of weaving at the Sibley Mill No. Montpelier, Vt.

Wm. H. Hassett of Worcester has been engaged to superintend the Hudson Blanket Co., Hudson, Mass.

Albert H. Gledhill, formerly designer for the Marston Worsted Co., Skowhegan, Me., has been appointed superintendent by Franklin Glazier & Son, South Glastonbury, Conn.

W. H. Emery, who has been employed at Mayo & Co.'s woolen mill for the past 18 years, will move to Guilford (Me.) where he has secured a position as assistant superintendent and overseer in the weave room.

J. L. Eddleman, formerly superintendent of the Edgefield Cotton Mill, is now superintendent of the Yazoo (Miss.) cotton mills.

Oscar Dietrick has returned to his old position as assistant superintendent and designer at the Montrose Woolen Mill, Woonsocket, R. I.

J. F. Clark has been promoted from overseer of carding and spinning to superintendency of the John M. Stone cotton mill at Starkville, Miss., taking the place of J. D. Mallory, resigned.

Benjamin C. Chase, Jr., recently superintendent of Cohannet Mill No. 3, of Taunton, Mass., has accepted the position of superintendent of the E. Jenckes Mfg. Co., Pawtucket, R. I. This company is one of the largest manufacturers of high grade plain and novelty yarns in New England.

R. W. Barber, who has been superintendent of the Brown Mills of the American Woolen Co., Dover, Me., completes his duties January 1st.

Harry Michelmore, who has been employed for the past eight years in the packing room of the Pacific Mill, has been appointed assistant designer for the Brightwood Mfg. Co., N. Andover, Mass.

Wm. Stuart, formerly of Nasonville, R. I., has been engaged as overseer of finishing for the Lawrence-Webster Co., Malone, N. Y.

J. F. Jones has been engaged as finisher for J. R. & C. W. Scott of Uxbridge, Mass.

Turner Rollinson, of Providence, R. I., has been engaged as overseer of dyeing for the Singleton Worsted Co., Franklin, Mass.

Geo. J. Fagan has succeeded his brother, the late M. H. Fagan, as boss dyer in the Carter & Rogers Woolen Mill, Lebanon, N. H.

John M. Wheaton, from Nashua, N. H., has taken charge of the weaving and designing for the Pequot Mills, Montville, Conn.

Philip Morin, overseer of weaving at the Hargraves Mills for several years, has resigned to accept a similar position at the Shove Mill, succeeding Mr. Kershaw. The position left vacant by Mr. Morin has been filled by Henry Omerod, of the Barnard Mills. It is probable that the second hand at the Barnard Mills will succeed Mr. Omerod.

Wm. Kingsley, formerly overseer of weaving at the Acushnet Mills, has resigned to accept a position in a large mill in Connecticut. Wm. Towne, who has been overseer of weaving in Suncook, N. H., is to succeed him.

Edward Haines, overseer of weaving at the Saranac Mill, Blackstone, Mass., for the past three years, has severed his connection with that company.

W. H. Eakers, formerly overseer of weaving, has been promoted to assistant superintendent of the Glastonia (N. C.) Mfg. Co.

Wm. M. Doyle, of Maynard, Mass., has taken charge of the weaving, nights, in the Nashua Valley Mills, Clinton, Mass.

Thomas Drury, formerly of the Ray Woolen Mills, Franklin, Mass., has accepted a position as overseer of weaving and dressing at the new Progress Worsted Mills, Ashaway, R. I. Martin Nelson is the finisher.

J. P. Crouch, formerly overseer of weaving at the Middle Georgia Cotton Mills, Eatonton, Ga., has accepted a similar position at the Edgefield (S. C.) cotton mills.

Thos. Sexton has succeeded Chas. Bromley as overseer of carding for the Greenville (R. I.) woolen mills.

Charles Sanford, formerly overseer of carding at the Luther Mill, Fall River, Mass., has accepted a similar position at the Merchant's Mill.

John Riley, recently second hand in card room at the Massachusetts Mills, Lowell, Mass., has accepted a position as overseer with the Bigelow Carpet Co.

Richard Lowe has accepted the position as overseer of carding left vacant by the resignation of Archibald McWilliam, in David N. Taft's mill, Oxford, Mass.

Mr. Brothrod, formerly overseer of carding for the Farmington Mills (Iowa), has resigned to accept a similar position with the Bonaparte Woolen Mills, Bonaparte, Iowa.

James Brand of Woonsocket, R. I., is worsted comber at the Hudson Worsted Co., Hudson, Mass.

Thos. Turnbull, who has been employed as spinner for the past 25 years for the Gleason Woolen Mill, Gleasondale, Mass., has resigned.

Geo. H. Heath has been engaged as boss spinner for W. & R. Brier, West Buxton, Me., to fill the position recently held by John Roach.

John Briggs, formerly secondhand of spinning at Mayo's Mill, Foxcroft, Me., is overseer in the new mill at Guilford. Wm. H. Emery of Foxcroft is to have charge of the weave room.

W. H. Fifield, overseer for the past 40 years for the Dwight Mfg. Co., Chicopee, Mass., intends soon to resign.

Kenneth McKenzie, formerly with the Whittier Mills, Chattahoochee, Ga., has accepted a similar position with the Lowe Co., Huntsville, Ala.

James T. Campbell, who has been second hand of spooling and warping in No. 3 Mill, West Warren, Mass., for the past six years, has resigned to accept a more lucrative position with the Otis Co at Ware, Mass.

Varnum T. Barber, for seventeen years superintendent of the Slater Cotton Co., of Pawtucket, R. I., has resigned his position, to take effect January 1.

Geo. Fox, who has been superintendent for the Middlesex Woolen Mills, Lowell, Mass., will sever his connection with those mill to take charge of Mayo & Sons' Woolen Mill, Foxcroft, Me.

Jas. Winning, formerly of No. Andover, Mass., has accepted a position as overseer of carding for the Beaver Brooks Mills, Collinsville, Mass.

E. Webb, formerly overseer at the Social Mill, Woonsocket, R. I., has assumed charge of the night and day work in the carding department of the Nourse Mills, of Woonsocket.

D. W. Stimson, formerly of New Bedford, Mass., has accepted a position as overseer of the carding and spinning department for the Thorndike Co., Thorndike, Mass.

Frank Reisdorph, boss carder for the Riverdale Woolen Co., has resigned.

Jos. Barnett has resigned his position as overseer of carding for the Matteawan Mfg. Co., Matteawan, N. Y.

Frank W. Whittle has accepted the position as superintendent of the Union Bleaching and Finishing Co., Greenville, S. C. Mr. Whittle was formerly with B. B. & R. Knights, Pontiac, R. I.

Chas. S. Robinson, who has been for 20 years second hand in the dressing and spooling department of the Hamilton Mills, Lowell, Mass., has resigned.

H. G. McNish, formerly of Elmira, N. Y., has accepted a position as overseer of combing in the Louisville Cotton Mills, Louisville, Ky.

Edward Toomey is overseer in the stretching room of the Eureka Silk Mill, Canton, Mass.

L. M. Wallace of Providence, R. I., has accepted a position as overseer of finishing for the Massasoit Woolen Mills, Huntington, Mass.

Philip Jackson, formerly of Torrington, Conn., has accepted a position as overseer of finishing for the Appleton Woolen Mills, Reedsburg, Wis.

Daniel G. Marley, Pawtucket, R. I., has accepted a position as overseer of finishing for the Merrimac Woolen Co. at the Navy Yard, Dracut, Mass.

Samuel Chadwick has accepted a position to take charge of the wet and dry finishing in the Germania Mills, Holyoke, Mass.

Geo. J. Pethybridge, boss dyer for the Jas. Roy Co., Watervliet, N. Y., has resigned.

David A. Lapraik, assistant dyer at the Franklin Mills, Franklin Falls, N. H., has resumed his duties after a month's vacation. Jas. A. Lapraik, a brother, took his place during his absence.

James Fraser, who has been overseer of dyeing for the Maine Woolen Co., Oldtown, Me., for the past six years, has resigned and been succeded by Harry Haigh.

William Kershaw, who has been overseer of weaving for a number of years at the Shove Mills, Fall River, Mass., and who has been acting as superintendent since the resignation of Edward Lynch, has severed his connection with the company.

R. J. Brown, formerly overseer of weaving at the Millfort Mills, Fort Mills, S. C., has been promoted to the position of assistant superintendent.

Burton Duxbury, of Fall River, Mass., formerly with the Heywood Narrow Fabric Co., has been engaged by Hanscom Bros. as overseer of their bleaching, dyeing and mercerizing.

Arthur O. Boulet of Woonsocket, R. I., has accepted a position as overseer of winding for Franklin Mills Corp. at Unionville, Mass.

John P. Cochran has severed his connection with the Maysville (Ky.) Cotton Mills for a position in a larger mill.

H. G. Poole, formerly at the Concord Mfg. Co., Penacook, N. H., has taken a position at the Oneka Woolen Mills, New Bedford, Mass., as pattern weaver.

Geo. Wells, one of the oldest loom fixers at the Atlantic Mills, Olneyville, R. I., has severed his connection with that establishment and has accepted a position as assistant foreman of the Lorraine Mills, Pawtucket, R. I.

Gustavus Shellsmith, boss finisher at W. E. Hayward Co.'s mill, East Douglas, Mass., was agreeably surprised recently when, on being invited to the home of Mr. and Mrs. Dufault, he found his employes assembled and was presented with a cuckoo clock. About 25 were present. Refreshments followed and a pleasant evening.

Walter Pine, overseer of weaving at the Schuster Mill, East Douglas, Mass., received a handsome gold watch as a Christmas gift from his employes. Mr. Pine has been with the mill since it was dedicated a year ago and is well liked.

E. E. Aspinwall, superintendent of the Windham Mfg. Co., Willimantic, Conn., has resigned and will be succeeded by Walter Knight. Mr. Aspinwall was formerly the New England agent of the

De Haven Mfg. Co. of Brooklyn, N. Y., and he will re-enter their employ as their general agent for the United States. Upon his retirement from the Windham Mfg. Co. the employes presented him with an elegant diamond ring.

Jas. McDougall has resigned his position as superintendent of the Anderson Mills, Skowhegan, Me., to take the position left vacant by the resignation of S. G. Hall, who was agent of the Kennebec Mills, Fairfield, Me.

Leander Davis, formerly superintendent of Mayo Mill No. 2, Millbury, Mass., has resigned to accept a similar position with the Akronia Fabric Mfg. Co., West Millbury.

Arthur Little, boss finisher in the New England Mills, Rockville, Conn., has resigned to accept a position in Winooski, Vt.

David Lavoie, who has had charge of the fulling for the Dawson Mfg. Co. for the past ten years, has resigned and accepted a similar position with the Darling Woolen Co., Holliston, Mass.

Walter Whitfield, formerly of Philadelphia, Pa., has accepted a position as overseer of weaving at the Maine Woolen Mills, Old Town, Me.

R. Schrayer, recently a foreman in the weaving room of the Norwalk Mills Co., Norwalk, Conn., has resigned and is building a factory on his premises for the manufacture of rugs and rag carpets.

Ernest Rhodes, formerly of Montreal, has accepted a position as designer for the Broad Brook Co., Broad Brook, Conn.

Roland Sweeney, formerly with the Glendale Woolen Co. (R. I.) has accepted a position in the dye house of the Slatersville Finishing Co., Slatersville, R. I.

Geo. Pethybridge has returned to his old position as overseer of dyeing at the Watervliet mills of Jas. Roy & Co.

Gustav Weder has accepted a position as carder and spinner for the Earnsdale Worsted Co., Clinton, Mass.

M. J. Riendeau, formerly of Hebronville, Mass., has accepted the position of overseer of carding for the Readville (Mass.) Cotton Mills.

J. A. Murray has secured a position as overseer of night carding at the Mascoma Mills, Lebanon, N. H.

H. H. Groves has been engaged to take charge of the card room for the Marland Mills, Andover, Mass.

Benjamin Davis, formerly overseer of carding at the Cohannet Mills, Taunton, has accepted a similar position at the Merchants Mill, Fall River, Mass.

James Clegg, of Canton Junction, Mass., has taken charge of the carding in the Stoughton Mills, West Stoughton, Mass.

Edgar R. Allen of Worcester, Mass., has taken charge of the combing for the Tingue Mfg. Co., Seymour, Conn. He was formerly second hand at the Queensbury Mills and has been succeeded by D. W. Twomey.

Joseph Dudley has accepted a position as overseer of ring spinning at the Hargreaves Mills, Fall River, Mass.

Robert B. Ogden, formerly master mechanic at the Davis Mill, Fall River, Mass., has accepted a similar position at the Parker Mill.

Napoleon LaRose has taken the position of chief mechanic in the Merrimac Woolen Mills, Dracut, Mass., left vacant by the resignation of Ralph Black.

Peter Todsen, overseer in the Durfee Mills, Fall River, Mass., for the past 25 years, has retired from mill business.

Walter M. Lamont has been appointed as superintendent for the new Wood worsted mill in Lawrence, Mass. He has been for some years connected with the Washington Mills plant of the American Woolen Company.

Arthur R. Jones, formerly superintendent of the Anderson Mills, has been promoted to the superintendent's position, succeeding Jas. McDougall.

Wm. H. Greenwood, of Corrinna, Me., brother of John R. Greenwood, superintendent of the Mayo Mills, Millbury, Mass., has been appointed superintendent of Mayo No. 2 Mill, to succeed Mr. Davis.

A. Greaves, formerly of the Riverside Mills, Providence, R. I., has been appointed superintendent of the Cranston Worsted Mills, Bristol, R. I.

William Fell, superintendent of the Brookville Mills (Pa.) has resigned to accept a position with Flinn Bros. at Emlenton, Pa.

John M. Crawford, formerly book-keeper at the Stevens Linen Works, Webster, Mass., has been appointed superintendent and his brother, Joseph Crawford, takes the place left vacant.

It has been reported that Jas. Bathgate of Foxcroft, Me., may accept the position as superintendent of the Niantic Mfg. Co. left vacant by William Park. Mr. Bathgate has been for 20 years superintendent of a woolen mill about the size of the Niantic Mfg. Co. and has an excellent business record.

William P. Barnes, superintendent of the Rushton Cotton Mills, Griffin, Ga., has been appointed general manager of the Hope Mills Mfg. Co. mill in Hope Mills, N. C.

W. H. Ryder, for years acting superintendent of the Earnscliffe Mills, Providence, R. I., has severed his connection with that company, that he may devote his entire time to an invention which he is to place upon the market. He was presented with a purse by the employes of the weave room, of which he has been overseer.

William B. Orr has severed his connection with the Adams Woolen Co. (Adams, Mass.) and will give his entire attention to the Renfrew Mfg. Co., of which he is manager. F. U. Stearns of New York has been elected treasurer of this company to fill the vacancy caused by the death of Ernest L. Hill.

Foreman John Hey, of the Sayles & Pendergast Mill, Woonsocket, R. I., was presented with a handsome water set by the day weavers. Loom Fixer Peter Harrison was given a very fine pipe.

Robert W. Boys, overseer of weaving for the Newmarket Mfg. Co., Newmarket, N. H., is receiving congratulations on the birth of a son.

Joseph Feeley, engineer at the Manton Mills, Manton, R. I., has resigned to accept a position in Central Falls, R. I.

W. S. Rogers, who recently retired from the Amoskeag Corporation after a service of 30 years as overseer of dressing in No. 3 Mill, was recently, on his 78th birthday, presented by the employes with a mahogany chair, upholstered in leather and a bouquet of flowers.

James Muir, who has been second hand in card room of the Massachusetts Mills, Lowell, Mass., has resigned to accept a similar position with the Savannah Cotton Mills (Ga.). He is succeeded by James White, formerly third hand.

Frank Wigglesworth, who has been loom fixer at the Vassalboro Mills, N. Vassalboro, Me., for the past 12 years, has resigned.

Deaths.

Chas. F. Strunz, superintendent of the Hopewell Mills, and one of the leading citizens of South Glastonbury, Conn., died at the company's office, Nov. 27th, of heart disease. Mr. Strunz entered the employ of F. D. Glazier & Son as loom fixer in 1884, and in 1894 was appointed superintendent, which position he has filled successfully. He leaves a widow.

William Forbes, of Lawrence, Mass., died at his home Nov. 26th. Mr. Forbes was born in England, Came to Boston in 1848, later going to Dedham where he obtained a position in the Merchants' Woolen Co.'s Mills. He remained there sixteen years, advancing to superintendent, resigning to accept a similar position in the Dracut Woolen Mills at Collinsville. He remained here ten years, leaving finally to enter other business. He is survived by a widow and four sons.

Joseph A. Pierce, a veteran cotton manufacturer, died at his home in Providence December 2d. Mr. Pierce was 73 years of age and had spent about 60 years of his life in the cotton mill business.

Edwin Giles, formerly of Utica, N. Y., died recently. He had been overseer of dyeing for the Buell Mfg. Co. for the past 20 years. Mr. Giles was 56 years of age, and a very popular man, both in business circles and socially. The mill closed during the funeral services, which were attended by many of his former associates.

Oswald Lever, widely known as a builder of textile machinery, died suddenly of apoplexy at his home on November 30th. Mr. Lever was born in England in 1844 and came to this country when a boy. He engaged in the machinery business about twenty-five years ago, and for many years the business was conducted under the name of Lever & Grundy, but for a number of years past has been conducted by Mr. Lever alone. He was prominent in Masonic circles and a member of a number of clubs and organizations in Philadelphia, including the Manufacturers.

Hon. Charles A. Marston, president of the Marston Woolen Co., Skowhegan, Me., died recently at the age of 56.

J. W. Lanham, late superintendent of the cotton mill at Cowpens, S. C., died recently at his home in Spartenburg, S. C. He had been employed in the cotton mill business about sixty years. Three sons and three daughters survive him.

James Iredale died at his home in Torrington, Conn., recently. Mr. Iredale was born in England 86 years ago, and for the past 40 years has been closely identified with the growth of the Warrenton Woolen Co. He is survived by a widow and one son.

Wm. C. Haberer, superintendent of the Bedford Mills Co., Bedford City, Va., died recently.

Joseph H. Bragdon, the editor and publisher of the Textile Manufacturers' Journal of New York, died December 23d at his home in Flatbush. For a number of years Mr. Bragdon has been in poor health and for the last few months unable to give close attention to business, and yet his death came as a surprise and shock to his associates and the trade. He was born in Newburyport, Mass., fifty-five years ago and has been identified with textile trade journalism for about twenty years. His first association was with the Wool and Cotton Reporter, which he left in 1894 to establish the Textile Manufacturers' Journal. Mr. Bragdon was widely known and popular throughout the textile trade, and was a stanch supporter of everything that tended towards the best interests of the industry and along the lines of honorable and enterprising trade journalism. He leaves a widow and one son, a young man about to enter college.

Edward W. Chamberlain, treasurer of the Indiana Cotton Mills, Cannelton, Ind., died at his residence in Louisville, Ky., recently. He was 71 years of age, a native of Salem, Mass., and leaves a widow and one son.

Alvin J. Smith, agent of the Clinton Mills, Norwich, Conn., died recently of heart trouble. Mr. Smith was sixty years of age and had been connected with the Clinton Mills for over thirty years.

Thos. Lenihan, late owner of spinning for the Westerly Woolen Co., Westerly, R. I., died recently at 57 years of age. He had been in the service of this company for the past 30 years and the mill closed during the morning of the funeral, that employes might attend the last services.

William Crane, who has been overseer of the shipping department of the Washington Mills, Lawrence, Mass., for the past 20 years, died at his home, November 16th. Mr. Crane was one of the best known citizens of Lawrence and highly respected and had he lived was to have been superintendent of all the finishing and shipping in the Wood Worsted Mill.

John Van Lansing, a pioneer knit goods manufacturer of the Mohawk Valley, died in Cohoes, N. Y., recently, at the age of 76. He was the organizer of the Knit Goods Manufacturers' Association of America, and was president of the organization during its life.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

Moody's Magazine; edited by Byron W. Holt; The Moody Corporation, 35 Nassau St., New York. Price $3.00 per year.

The first issue of this magazine is very promising and if its standard is maintained success would seem to be assured. Following is an abstract of the contents: Critical Comment on Current Events; Symposium—The Increasing Supply of Gold; Pitfalls of Speculation; Unprecedented Prosperity as Shown by the Facts; Where the Capital Comes From; Canada and the Preferential Tariff; Common Mistakes in Accounting; It Pays to Keep Posted; Stock Market Outlook; Correspondence; Inquiry Department; Books and Periodicals.

A Reply to the Report of the Tariff Commission on the Cotton Industry; by S. J. Chapman, M. A.; 154 pages, 6 by 9 1/2; Sherratt & Hughes, Manchester and London. Price 50 cents.

This reply to the report of the British Tariff Commission on the Cotton Industry was prepared by the professor of political economy at the University of Manchester, from material supplied to him by a special committee of prominent cotton spinners, manufacturers and merchants of Lancashire. It is a high compliment to the report itself that it should call forth such a reply and like the report it is filled with valuable information relating to the fiscal question. In all probability a great deal of truth is found in both volumes and the whole truth in neither. The reply is well worth consideration by those who make a serious study of tariff questions.

Hypochlorite and Electric Bleaching (Hypochlorite und elektrische Bleiche); by Viktor Engelhardt, pp. 273, 6 1/2 by 9 1/2, 266 illustrations; Wilhelm Knapp, Halle, Germany; price $4.00.

The author of this work describes the various apparatus that have been designed for the production of hypochlorite for bleaching by electricity. The work is divided into the following chapters: direct electric bleaching; indirect electric bleaching; supplementary processes; chronological list of the processes described. The work is profusely illustrated and the author has carefully collated the descriptive matter. This book, which is in German, is to be followed by another treating of the practical application of the electric bleaching process in various industries.

Textile Industry in the Industrial Life of Silesia (Die Textilindustrie im Wirtschaftsleben Schlesiens); by Dr. sc. pol. Curt Frahne; 256 pages, 9 by 6 1/2; H. Laupp'sche Buchhandlung, Tubingen, Germany. Price $2.50.

This work is a remarkable example of the time and labor spent by German writers in compiling statistics and writing historical sketches regarding subjects which are not of general interest. To any one interested in the textile industry of Silesia this work will supply a vast fund of detailed information regarding the growth of the industry in that country.

The Graphic Yarn Calculator; by Thomas Oliver, B. Sc.; 36 pages, 5 1/2 by 8 1/2; published by the author at Galashiels, Scotland. Price, $1.00.

A prominent feature of this book is the diagram of yarn numbers, by which the equivalent of a yarn count is indicated graphically by diagrams based on co-ordinates. However great may be the value of such a system to the student interested in the theory of textile weights and measures, it will prove of practically no use to the manufacturer or mill worker. The second chapter begins with a fairly clear explanation of the calculations of twist counts by arithmetical processes. The author calls them tedious and turns with evident relief to his diagram of co-ordinates for further elucidation of the subject. We are inclined to think that textile manufacturers will turn with even greater relief from the diagrams to the simple rules of arithmetic. The reader will find a number of yarn and cloth calculations explained and illustrated by practical examples in the third chapter. Under the title "Short Cuts on Textile Calculation" a table of conversion factors makes conversion appear rather more involved than it actually is. The other short cuts are used in solving problems involving many old local customs which persist in Great Britain, but which happily were not transplanted to America with the English system of textile weights and measures.

The mathematical part of this work has been very carefully written, but we wish the author had devoted himself to the task of simplifying textile arithmetic and thus supplied the textile trade with a handbook that would facilitate the daily calculations of the mill and counting room.

When introducing the subject of yarn numbering the author states that "it is probable that in a few years it (the metric system) may become the legal standard throughout the world." This is but prophecy which should find no place in a work on mathematics. The author also falls into a surprising error in the following historical reference to French practice in the silk trade: "The Italian 'denier' system has been legalized in France on the recommendation of the 1900 congress, when it was found that the 500 meter system, invented by the congress in 1866 had received no attention from manufacturers." The 500 meter system was established by the law of 1866, which has not been repealed; the silk trade has never used it. The denier system was established by mill practice, a higher authority than that of the statute book, long before the metric system was invented. It is now the silk standard of the world, and its "adoption" by the 1900 congress was a complete surrender and confession of failure to establish a metric system for silk.

Chemistry of the Substantive Dyestuffs (Chimica delle Sostanze Coloranti); by Dr. Arturo Pellizza; Ulrico Hoepli, Milan, Italy. 472 pages, 4 by 6 in. Price $2.00.

This work shows that the remarkable development of the textile industry in Italy is being accompanied by a corresponding progress in the publication of technical books in Italian treating of the textile industry. The author deals chiefly with the theory of the subject, but has presented a large amount of material of great value to the practical dyer. The text is in Italian.

Calendars.

The India Alkali Works, 28 India Wharf, Boston, manufacturers of "Savogran," are sending out a neat office calendar in red and gray.

H. W. Butterworth & Sons Co., builders of bleaching, dyeing, drying and finishing machinery, at Philadelphia, are sending to the trade an attractive desk calendar in a black leather frame.

The Wm. Kedward Dyeing Co., Philadelphia, Pa. This firm, dyers and bleachers of mercerized and cotton warps and skein yarns, are presenting the trade with a large wall calendar printed in two colors.

The Bourse, Philadelphia, Pa.—An engagement pad for every day in the year, conveying the compliments and best wishes of The Bourse.

Thomas H. Ball, Philadelphia, Pa.—A large size calendar for office use and having a lithographed reproduction of a woman's head.

Phenix Fire Insurance Co., Brooklyn, N. Y.—A business-like calendar for office use sent out by the New England agent, Thomas W. Penhallow, 53 State St., Boston.

The West Indies Chemical Works, Ltd., New York.—This firm, manufacturers of the "Alligator" brand of logwood extracts, are sending out to the trade a large wall calendar, which besides the usual matter shows a map of the world with the principal trans-oceanic and continental lines of travel plainly marked.

Business Literature.

Mason Reducing Valves; Mason Regulator Co., Boston, Mass.

An attractive pamphlet of 55 pages containing descriptions, illustrations and price lists of various types of Mason reducing valves. The work designed for each type is carefully stated so that valve users can determine the particular style that is best calculated for their requirements. The illustrations accompanying the reading matter are especially good. The price lists are given in detail regarding the sizes, etc.

Metallic Toothing.

It was only a short time ago that the James Hunter Machine Company of North Adams, Mass., added a department for the manufacture of metallic toothed rolls and metallic breast for garnett machines. Before they went into it they gave the matter careful consideration and equipped the department with every facility for turning out good work. The results have been extremely gratifying. They are doing a large business in this branch and taking many orders for such work from their old customers.

Hosiery and Underwear Forms.

A souvenir, which is as handsome as useful, has just been received from the Wisconsin Manufacturing Co. of Two Rivers, Wis. It is made from material used by them in manufacturing their line of hosiery boards, glove and mitten forms. The souvenir is made in the shape of a ladies' miniature hosiery board, is neatly printed with the advertisement of the company issuing it and also has attached a good sized thermometer. The Wisconsin Mfg. Co. began the manufacture of hosiery boards about five years ago, and have built up a large trade. They have recently brought out two new shapes, which are attracting considerable attention. The ladies' form is the "Miss Alice" shape for ladies full fashioned hosiery and the "Old Grover" for men's hose. Besides their regular line of hosiery shaping boards, etc., they also manufacture a complete line of underwear forms. The manufacture of bobbins, spools, etc., was recently begun. Samples and prices will be sent free of charge upon application.

The Continental Color & Chemical Co.

The Continental Color & Chemical Company has been incorporated under the laws of the State of New York. The directors are Adolf Kuttroff, I. J. R. Muurling, Carl Pickhardt and William Diestel. The management of the company is vested in an executive committee, consisting of Adolf Kuttroff and I. J. R. Muurling.

From the first of January, 1906, the company will have the exclusive sale in the United States and Canada of the products of the Badische Aniline and Soda Fabrik, Ludwigshafen A/R, and Farbenfabriken, vormals Friedr. Bayer & Company, Elberfeld, the business of Kuttroff, Pickhardt & Company and the Farbenfabriken of Elberfeld Company being transferred to the new company.

The New York officers of the company will be located at 128 Duane street. They will have branches in Boston, Providence, Philadelphia, Chicago, Charlotte, N. C., and in Canada.

The Humphrey Machine Company have recently installed one of their new 1000-gallon rotary fire pumps at the Airlee Mills, Hanover, Conn.

The past few months have been exceptionally busy ones for the shops of the American Blower Company at Detroit, Michigan. They report that their books show outfits for heating and ventilating some fifty schools and other public buildings, between thirty and forty manufacturing buildings, and a large number of dryers for brick, lumber and other materials. They are also doing a large business in the installation of mechanical draft plants.

Doffer Combs.

The factory and business of the late James E. Standring has been acquired by Edward Standring and will be continued under the name of The Newburgh Comb Plate Works at Newburgh, New York.

Business Opportunities in the South.

The St. Louis & San Francisco Railroad Co., better known as the "Frisco," has built or added to its system, over nineteen hundred miles of new railroad during the past five years. Another thing to be remembered is the fact that all of this new railroad traverses newly-settled sections of the southwest, principally in Missouri, Arkansas, Indian and Oklahoma Territories and Texas.

These sections of the southwest are rapidly settling up with a good class of northern immigrants impelled to locate in the southwest for the following reasons: Lands for the cultivation of a wide range of crops can be purchased most reasonably; the climate is mild and there are no extremes of heat and cold, such as obtain in the northwest, and ample rainfall annually to mature crops.

Most of the sections traversed by these new lines have not previously enjoyed the privileges of railroad communication and these lines, therefore, opened up entirely new markets to the manufacturer and wholesaler.

It is a self-evident proposition that it is cheaper to utilize in manufacturing the raw material at its source, instead of shipping it in a crude state to some large city or remote, thickly settled section. This is a fact that manufacturers are beginning to realize more and more and for various reasons are turning their steps toward the singularly favored locality.

The principal raw materials in the southwest available in large quantities for manufacture are cotton and its by-products; all the grains; almost every kind of timber found in the north temperate zone; all of the truck crops, vegetables, melons and fruits; minerals, including iron, lead, zinc, gypsum; stone, including granite, limestone and cement rock suitable for Portland cement; highest grade of shale for pressed, paving and fire brick, pottery, tile and sewer pipe. Last and most important is this fact, that in almost every portion of the states and territories traversed by the Frisco system, fuel supply is abundant, either bituminous or semi-anthracite coal, oil or natural gas being procurable.

Labor troubles also in the southwest are of much less frequent occurrence than in the large ciites and thickly-settled localities of the north and east. Possibly the most attractive inducement, however, that could be given manufacturers to secure the location of their industries, is the fact that they would in most cases have a proprietary right to a vast section of rich territory, as they would be almost the only manufacturer in their particular line in the southwest. They would, therefore, be free from most of the competition met with in the factory sections of the north and east.

From the above extended list of natural resources for manufacturing it can readily be seen that almost every kind of manufacturing plant can be accommodated with an excellent location.

The Industrial Commissioner of the Frisco System, M. Schulter of St. Louis, Mo., would like to get in correspondence with any manufacturers not entirely satisfied with their present factory locations and will cheerfully furnish data regarding favorable locations, inducements, etc.

Diary Memorandum.

The American Supply Co., of Providence, R. I., have sent to their friends in the trade a most useful souvenir for 1906 in the form of a vest pocket memorandum and diary, which contains besides much information of reference value, together with maps of service to the traveler.

Ribbons and Tapes.

The Wick Narrow Fabric Co. occupied new sales rooms, 708 to 710 Market St., on January 1st, which will give them needed additional facilities for the sale of their specialties in ribbons, tapes and braids. Their mills are at Paterson and Philadelphia.

The Westinghouse Electric & Manufacturing Co. are furnishing equipments for an unusually large number of industrial power plants of a diversified character. Among recent shipments are included one to the Lehigh-Northampton Gas & Electric Co., Catasauqua, Pa., of a 150 K. W., 350 volt, three wire engine type generator and two auto transformers; to the Keystone Coal & Coke Co., Keystone, W. Va., one 250 K. W., 550 volt, engine type generator and a 60 K. W., two phase, 1100 volt alternator; to the Granite City Hospital Granite City, Ill., a 35 K. W., 250 volt type S engine type generator, and many others could be mentioned.

Owing to the magnitude of the works of the Westinghouse Electric & Manufacturing Company a great many people have received an erroneous impression that the product of this company consists principally of the larger types of electrical apparatus, especially so with reference to electrical generating units. This wrong impression is largely due to the fact that most of the great power plants of the country, having the largest units, are equipped with Westinghouse generators and auxiliary apparatus. The aggregate business of this company, however, in the smaller units far exceeds that of the larger and special types. They manufacture every kind of electrical apparatus for either light or heavy work and their instruments for measuring electrical energy equal in delicate construction the works of the better class of modern watches. These instruments are recognized standards in their field.

Big Repeat Order.

In May, 1893, the first Jones stoker in Chicago was installed in the Fraser & Chalmers plant under an 80 h. p. boiler. The stoker was in constant service until the plant was abandoned about two years ago.

On Nov. 10th, 1905, the Under-Feed Stoker Co. of America sold to the Allis-Chalmers Co., the successors of Fraser & Chalmers, 20 Jones stokers for equipping the boiler plant in its big new West-Allis plant, in Michigan.

The Allis-Chalmers Co., being probably the largest builders of steam engines in the country, can appreciate better than any one else the value of an appliance of this kind.

The Warren Pulley Cover.

The Warren Company, Orleans St., Chicago, who have manufactured and sold Warren's pulley cover to textile mills and other power users of the United States for the past eight years, report recent orders from France, Mexico and Canada, in addition to their domestic business. The Alcorn Woolen Mfg. Co., Corinth, Miss.; Bemis Bag Co., Jackson, Tenn., and the Langley Mfg. Co., of Langley, S. C., are among the Southern textile mills that have reordered this covering recently. The following reorders and letters from well-known manufacturers speak for themselves.

Piedmont, Ala., Aug. 28, 1901.

The Warren Co., Chicago.

Gentlemen:—Please ship us one case Warren's pulley cover same as you shipped us March 12th, 1901.

Coosa Mfg. Co.,
J. W. Hawke, Treas.

Sept. 28, 1901.

Gentlemen:—Please express to us one case of Warren's pulley cover same as before.

Coosa Mfg. Co.

Gentlemen:—Please express to us one case of Warren's pulley cover same as before.

Yours truly,
Coosa Mfg. Co.

Dwight Mfg. Co.,
Alabama City, Jan. 21, 1902.

The Warren Co., Chicago.

Gentlemen:—Please send us one can of Warren's pulley covering same as last ordered.

Yours truly,
J. H. Moody, Supt.

July 20, 1903.

Gentlemen:—Please send one can Warren's pulley cover, same as last. Yours truly,
J. H. Moody, Supt.

Feb. 7, 1904.

Gentlemen:—Please send us the following: One case of Warren's pulley cover same as last ordered. Yours truly,
J. H. Moody, Supt.

April 10, 1905.

Gentlemen:—Please send us the following: One case Warren's pulley cover, about 125 sq. ft.

Yours truly,
J. H. Moody, Supt.

Gentlemen:—Please send us the following: One case Warren's pulley cover same as last.

Yours truly,
J. H. Moody, Supt.

Waltham Bleachery & Dye Works,
Waltham, Mass., Nov. 26, 1901.

The Warren Co., Chicago.

Gentlemen:—We have used your pulley cover on several of our hardest drives over iron pulleys and find that it comes up to all expectations.

Very truly yours,
G. E. Jordan, Agt.

Office of Saxonville Mills,
Saxonville, Mass., Oct. 26, 1905.

Messrs. Warren Co.

July 25th, 1904, you sent us a special case of your pulley cover. It has given us excellent satisfaction. You may now send us twice the quantity we first ordered. Yours truly,

Saxonville Mills.

Repeated reorders are the best evidence of the merit of an article and of the esteem in which it is held by its users.

The Smith & Furbush Machine Company of Philadelphia recently supplied to the Cleveland Woolen Mills at Cleveland, Tenn., four sets of their latest cards, equipped with Torrance ballers and barker rubs.

Fans for Dryer.

The Standard Wall Paper Co. of Sandyhill, N. Y., who claim to be the largest makers of wall paper in the world, have within the last two or three years had occasion to instal considerable apparatus manufactured by the American Blower Co. of Detroit. Their experience with same is stated in a letter recently addressed to that company as follows:

"Replying to yours of the 7th, would say that we have two of your 100-inch fans in operation in our Sandy Hill plant, which are used for drying purposes, one of which is operated with a motor, and the other with one of your Type A engines, and we are pleased to say that they are in all respects the most satisfactory equipment of the kind that we ever had anything to do with. The heater and the fan, with the engine just received, were put in complete operation in thirty-six hours after they were received. Everything seemed to fit perfectly."

A Model Winter Colony.

The attractiveness of Lakewood is greatly enhanced by the architecture of private residences which has been successful to a remarkable degree. Every variety of style and scale is artistically represented. Those which harmonize best with their surroundings, on the whole, are perhaps those after the antique Dutch model designed from the Copley prints. Their colored roofs and rough plaster half hidden in ivy, peep out charmingly from their setting of gnarled pines.

The hotels are built on a vast scale and are not surpassed by those of any other resort in appointments and comfort. The fact that Lakewood does not contain a single cheap or tawdry feature should not convey the impression that it is exclusively a resort for the rich. Rates are moderate at the hotels and it is pre-eminently a resort for the business man. There are also numerous private boarding houses suitable for families of moderate means, and the excellent schools make Lakewood especially suitable for a winter home. The Lakewood booklet, published by the Central Railroad of New Jersey contains information of value to those interested, including institutions of the town, opportunities for out-door recreation and general advantages, as well as the names and rates of the best hotels and boarding houses. This suggestive brochure will be sent to anyone writing for it to C. M. Burt, General Passenger Agent, 143 Liberty Street, New York City.

A World-Wide Textile Authority.

We doubt if there is another trade publication in the United States, except possibly some of the export journals, which has subscribers in more foreigh countries than the Textile World Record. We believe there is not a country in the world, where there are textile establishments, where the Textile World Record is not subscribed for. In Japan more than one-half of the textile mills are subscribers to the Textile World Record; one mill subscribes for ten copies.

Following is a list of foreign countries in which are subscribers to the Textile World Record:

Australia, Austria, Belgium, Brazil, Canada China, Cuba, England, Finland, France, Germany, Holland, India, Ireland, Italy, Japan, Mexico, New Zealand, Norway, Philippine Islands, Portugal, Porto Rico, Russia, Scotland, Spain, Sweden, Switzerland.

Heating and Ventilation.

The London Power Omnibus Company is the first company to run motor omnibuses without a break for the last two years, and justly deserve the name, "Pioneer," which they have now adopted.

The "Pioneer" company, as it is now known and recognized, has also built, at Cricklewood, the largest garage in Europe, capable of holding at least 200 motor omnibuses.

The car-house and the repair shop are heated and ventilated by the latest improved system, as built by the Buffalo Forge Company, 39 Victoria St., London, S. E. Each building is equipped with a separate plant, which accomplishes the heating as well as the ventilation, in a most thorough manner. The arrangement of the plant is such that it may be used for heating only when there is necessity for ventilating, and when the motor 'buses are in the car-house it is essential where the fumes of petrol are present to dispel these fumes by rapidly circulating a large volume of fresh air. By a very simple arrangement of doors leading into the heating chamber, from within the building and from the outside, this ventilation is obtained.

The plant is located at convenient points on platforms, and the boiler for supplying the steam at a pressure of 15 pounds is placed underneath the largest. This boiler is a low sectional type, having an unusual large heating and grate service. By this arrangement the water on condensation is returned by gravity to the boilers, and in this way used over and over again. This is a distinct advantage, in so far as by using the same water it prevents scaling of the boilers and considerably increases the economy and efficiency of the plant. The plant is compact and centralizes, and so arranged that only a portion of the heating surface is used, sufficient to meet the reqnirements of any particular outside temperature.

For the car-shed 18,000 cubic feet of fresh air is forced into the building every minute, which corresponds to an air change for the entire building of twice per hour. For the repair-shop 5,000 cubic feet of warm, fresh air is supplied per minute. The plant consists essentially of a large, slow-running steel-plate fan, which draws air from outside or from within the building as required, and forces this air over a battery of heating coils, where it is warmed up to the required degree, and then distributed over the building by means of a system of air distributing pipes.

For driving these fans electric motors are used on account of the small amount of attention which they require. This combined system of heating and ventilating is admirably adapted to such buildings, and its application is made without taking up any of the usual floor or wall space. It was adopted by the London Power Omnibus Co., after carefully studying all the various systems in current use, being the most up-to-date and efficient for their purpose.—London Daily Telegraph,

Many Orders for Sentinel Stop Motions.

During the last two weeks the American Textile Appliances Company, Boston, has received six repeat orders for their Sentinel electric warp stop motion, aggregating over 4,000 looms.

Announcement.

Messrs. Boger & Co., who have, for several years, been conducting a business for the sale of cotton and wool at 248 Chestnut Street, Philadelphia, have sent out to the textile trade a card announcing the fact that they have added a yarn department in which they will carry all grades of cotton yarns for the weaving and knitting trades. This announcement no doubt will be received with favor by the trade when it is known that the manager in charge of this department is E. W. Knapp, who has for some time been located with one of the foremost yarn dealers in the country and who, the announcement states, will give any inquiries his personal attention. From Mr. Knapp's wide and personal acquaintance among the manufacturers in this vicinity there is no doubt that he will meet with as much success in the future as he has in the past and Messrs. Boger & Co. are to be congratulated in getting the services of such a man to conduct their new department.

New Boston Office.

J. Frederic Houston & Co., manufacturers of cotton yarn, whose main office is in the Provident Building of Philadelphia, with mills at Cumberland, N. C., have opened a Boston branch in the Shoe & Leather Building, 114 Bedford Street, under the management of W. H. Angeny.

New Dyeing Machine.

In the December issue of the Textile World Record there appeared a description of a new patent relating to dyeing machines, in which the address of the builder was inadvertently omitted. Messrs. Smith, Drum & Co., 2305 Coral Street, Philadelphia, are the builders.

Fall River Mill Dividends.

A recent report compiled by G. M. Haffords & Co., Fall River, Mass., shows the dividends declared by thirty-five Fall River cotton mills operating 2,535,084 spindles. The total capital stock of these mills amounts to $22,875,000. The dividends paid in 1905 amounted to $688,600 or 3.01 per cent. on the capital stock, a decrease of $80,350 as compared with 1904.

Waste Silk in Woolens.

Some British manufacturers of woolens are familiar with the use of silk noils (writes a correspondent), but few have experimented with silk waste. In America large quantities of tussah waste are being used to replace prohibitively dear wool. The American manufacturer has an incentive to do so which is lacking in our country. Imported wool in the United States is taxed up to sixpence per lb., whereas raw silk materials are admitted free of duty. The phenomenal dearness of wools—some of which have quadrupled in price since last December in America—and this artificial consideration combine to make the use of silk desirable wherever practicable. While America is denuding the market of its limited supplies of tussah silk, it is not the moment for Englishmen to engage in the use of that material unnecessarily. Afterwards, when this staple is nearer its normal level, will be a more fitting time to experiment and to see what special effects tussah waste is capable of producing.

Tussah is the brown silk proceeding from the uncultivated worm, and the waste now favored in America is the by-product of silk throwsters, principally in China. The fibre is long and notably "shafty," and in the boiled-off, or discharged, condition is beautifully flossy. Discharging entails a loss of weight that woolen makers would probably be anxious to avoid. When carded "in the gum"—to use the silk dresser's phrase—tussah waste is still bright and attractive. Normally it is obtainable at low prices, for the once lucrative business of tussah yarn spinning is somewhat of a dead letter. In the days of seal plushes tussah waste reached an eminence to which it has never returned; and its employment by lacemakers, tapestry weavers, and others, has diminished since mercerized cotton came into vogue. A fitful demand for yarn for America is probably the chief outlet our spinners find for this material today.

The utility of tussah is circumscribed by the limitation of the number of shades to which it can be dyed. Shades of gold and rose are the lightest ordinarily obtained, and we believe that now it is possible to obtain a good black upon discharged tussah. These niceties need hardly trouble makers of tweeds, although they may interfere with the extended employment of alpaca, mohair and lustre wool dress goods mixed with tussah. The salient facts are that waste tussah presents the advantages of length, strength and lustre, combined with non-inflammability and durability in wear. These advantages, in certain circumstances, may warrant greater attention on the part of woolen manufacturers than has been given, and tussah may fitly be examined with an eye to some prospective employment.—The Textile Mercury.

Wood for Weaver's Shuttles.

In reply to inquiries Consul General Bradley of Manchester furnishes information in regard to the importation into England of persimmon wood used in the manufacture of shuttles, and furnishes the names and addresses of shuttle and shuttle-tongue makers in the Manchester district. Mr. Bradley says that persimmon wood and cornell (dogwood) are the two chief woods used in the manufacture of shuttles in that section, and that there is a large market in Lancashire for the sale of persimmon wood.

Popular and Unique.

If the query was made—which is the most widely known resort in the world, without hesitation the answer would be Atlantic City. Atlantic City gained its renown through its aggressive up-to-dateness.

Its position is unique, its attractions without equal, its hotels so numerous as to care for a hundred thousand visitors, its beach can accommodate multitudes, and its board walk is the greatest in the world.

Couple these to a fine climate, unlimited diversions and exceptional train service and you have the reason for Atlantic City's popularity.

The New Jersey Central can take you to Atlantic City on trains than which there are none finer, no quicker time can be made than it makes, and upon application by postal card, C. M. Burt, G. P. A., Central Building, New York, will send you a new illustrated booklet. Send for it.

The Goetze Gaskets.

The following extract from a letter recently received by Frederick Goetze, 723 East 141st street, New York, shows the favor with which the Goetze gaskets are being received by the trade:

"Having used a number of your gaskets in high pressure work in this city, we have found them so eminently satisfactory that we have laid in a stock of all sizes from 2 1/2 to 9 inches."—A. C. Smith & Co., Newburgh, N. Y.

A New Southern Mill.

The new mill of the Lumberton Mills at East Lumberton, N. C., which will start early in 1906, will manufacture colored yarns for the knitting trade on "Universal" cones. The new plant has 6,240 new spindles, giving a total capacity of 18,240. A Parsons steam turbine engine generator manufactured by the Westinghouse Machine Co. has been installed, which will furnish the motive power.

The Williamston Knitting Company, Williamston, Michigan, which we reported as organized in September, expect to have their plant in operation in January. They will bring out an entirely new line of goods in the way of "high art" knit gloves and mittens, which they say are unlike anything now on the market. They have a new and improved method of manufacturing these goods and others of a similar character.

The Wool Clip of the World.

A recent estimate of the world's wool clip made in England is as follows:

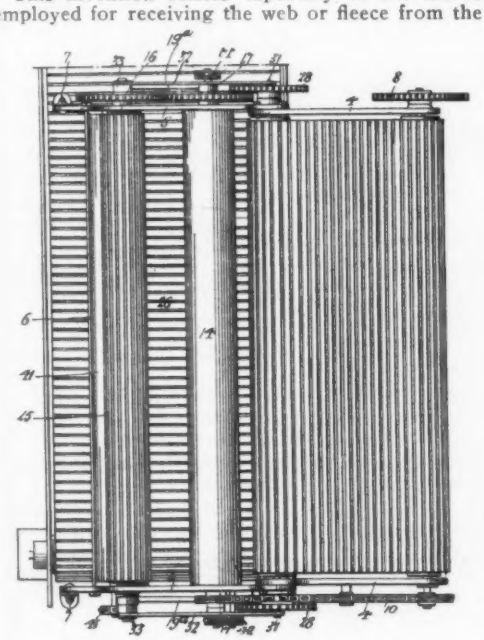
Europe.		
United Kingdom	133,000,000 lbs.	
Russia and Poland	361,000,000 lbs.	
France	103,500,000 lbs.	
Spain	102,500,000 lbs.	
Germany	49,500,000 lbs.	
Austria-Hungary.	64,000,000 lbs.	
Italy	21,500,000 lbs.	
Portugal	13,500,000 lbs.	
Sweden and Norway	8,000,000 lbs.	
Turkey and the Balkans	67,500,000 lbs.	
Other	14,000,000 lbs.	
		938,000,000 lbs.
North America.		
United States	287,500,000 lbs.	
Canada	12,000,000 lbs.	
Mexico	5,000,000 lbs.	
		304,500,000 lbs.
South America.		
Argentina	370,000,000 lbs.	
Chili	7,500,000 lbs.	
Brazil	1,500,000 lbs.	
Uruguay	96,000,000 lbs.	
Venezuela	15,000,000 lbs.	
Other	20,000,000 lbs.	
		510,000,000 lbs.
Central America.		
All countries	5,000,000 lbs.	5,000,000 lbs.
Asia.		
Russian Asia	60,000,000 lbs.	
British India	85,000,000 lbs.	
Turkey in Asia	33,000,000 lbs.	
Central Asia	46,000,000 lbs.	
China	36,000,000 lbs.	
Other	15,000,000 lbs.	
		274,000,000 lbs.
Australia.		
All countries	500,000,000 lbs.	500,000,000 lbs.
Africa.		
Algeria and Tunis	30,450,000 lbs.	
Egypt	3,000,000 lbs.	
Cape Colony	100,000,000 lbs.	
Other	1,000,000 lbs.	
		134,450,000 lbs.
Oceanica.		
All countries	5,000 lbs.	5,000 lbs.
Total		2,666,000,000 lbs.

Recent Textile Patents.

BRAIDING MACHINE Carrier. 805,910. Rudolf Hantusch, New York City.

CARDING MACHINES. Lap Feeding Device for. 805,934. Charles Schofield and Isaac Reeder, Philadelphia, Pa., assignors to William Schofield Co., of Philadelphia.

This invention relates especially to the means employed for receiving the web or fleece from the delivery-apron of the first carding-machine, and conveying it to and lapping it upon the transverse conveyer-apron. The purpose of the invention is to effect such conveyance of the web without injury thereto and to impart to-and-fro motion to the devices which direct the web on to the transverse conveyer-apron and also feeding or carrier movement to said devices without the use of any supporting rail or carriage for the laterally-swinging member of the device, without any direct connection with the carding-machine, and without any connection thereto which will prevent free access to all parts of the lower portion of the device or to the web which is being acted upon.



CLOTH CUTTING Machine. 805,104. Nelson I. Tefft and Dewey D. Tefft, Perry, N. Y.

CLOTH CUTTING Machine. 806,311. George L. Ballard, Rochester, N. Y., assignor to Ballard Bros., Rochester, N. Y.

COTTON HANDLING Apparatus. 807,881. Albert F. Tidwell, Celina, Texas.

COTTON MACHINE for Elevating and Feeding Seed. 807,654. Chauncey R. Bebefield, Dallas, Tex.

COTTON PICKING SPINDLE and Wiper. Spiral. 806,941. George N. Todd, Los Angeles, Cal.

COTTON PICKER'S Sack Carrier. 805,708. Wade A. Byrd, Swifton, Ark.

COTTON PRESS. 806,245. Pete Dunford, Summit, Ga.

DECORTICATING Machine. Plant. 806,429. Gustavo G. Remirez, Merida, Mexico.

DYEING APPARATUS. 806,793. Gustave A. Friedrichs, Woonsocket, R. I., assignor of one-half to Charles A. Proulx Woonsocket, R. I.

DYEING MACHINE. Fabric. 808,007. Jacques Cadgene, Zurich, Switzerland.

FABRIC CUTTING Machine. Pile. 806,204. Edward Stansfield, New York Mills, N. Y.

FABRIC HOLDING and Stretching Frame. 807,891. Murdock A. Weathers, Manchester, N. H.

FIBRE CLEANING Machine. 805,441. Hubert J. Boeken, Dueren, Germany.

FIBRE CLEANING Machine. Roller for Ginning, Burring and the Like. 806,727. William Youlten, Westminster, England.

FIBRE CUTTING Machine. 806,753. Arthur M. Sheakley, Stockton, Cal., assignor to Hercules Mfg. Co., Stockton, Cal.

FLAX BRAKE FEEDING Mechanism. 806,650. George H. Ellis, Chicago, Ill., assignor to International Harvester Co.

FLAX BRAKES. Automatic Feed Rebulating Device for. 806,787. George H. Ellis, Chicago, Ill., assignor to International Harvester Co.

LOOM. 806,726. Horace Wyman, Worcester, Mass., assignor to Crompton & Knowles Loom Works.

LOOM. 805,751. Carl Renger, Rio Janeiro, Brazil.

LOOM FILLING Replenishing. 805,497. Alfred E. Stafford, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM BEAMING Machine. 806,335. Harrison Garnett, Norristown, Pa.

LOOM CONTROLLING Means. 805,350. William F. Draper and Chas. F. Roper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM WARP Stop Motion. 806,725. Horace Wyman, Worcester, Mass., assignor to Crompton & Knowles Loom Works.

LOOM. Narrow Ware. 807,524. Adolph Widmer and Samuel Widmer, Paterson, N. J.

LOOM. Weft Replenishing. 805,109. Horace Wyman, Worcester, Mass., assignor to Crompton & Knowles Loom Works.

LOOM. Lappet. 807,070. Albert A. Gordan, Jr., and Alfred Morell, Worcester, Mass., assignors to Crompton & Knowles Loom Works.

LOOM PATTERN Mechanism. 805,756. Eppa H. Ryon, Worcester, Mass., assignor to Crompton & Knowles Loom Works.

LOOM SHUTTLE. Self Threading. 805,861. Henry A. Kennedy, Warwick, R. I., assignor to James Smith, Providence, R. I.

LOOM LET OFF Mechanism. 807,721. Thomas A. A. B. Carver, Glasgow, Scotland.

LOOM CONTROLLING Mechanism. 806,120. William Donner, Binghamton, N. Y.

LOOM FOR WEAVING Double Pile Fabrics. 806,729. George Zimmermann, Philadelphia, Pa.

LOOM FOR WEAVING. 807,791. Abraham Tcherniack, Moscow, Russia.

LOOM. Swivel. 807,081. Hector Ledoux, Worcester, Mass., assignor to Crompton & Knowles Loom Works.

LOOM TAKE-UP Mechanism. 807,580. Chas. F. Roper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOMS. Crack Preventing Means for. 804,981. C. F. Roper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOMS. Crack Preventing Means for. 804,964. Alida M. Marcoux, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOMS. Glass Bar Bracket for Double Decker. 807,206. Otto W. Schaum, Philadelphia, Pa.

LOOMS. Under Whip Pick Motion for. 807,054. John S. Ainley, Huddersfield, England.

PILE FABRIC. 807,678. Franz Kleutgen, Suelz, Germany.

SILK. Bleaching Artificial. 805,456. Charles A. Ernst, Lansdowne, Pa., assignor to Silas W. Pettit, Philadelphia, Pa.

SPINNING APPARATUS. Ring. 806,326. John J. Cronin, Manchester, N. H., assignor of one-half to Harry E. Parker, Manchester, N. H.

SPINNING FRAME. 806,016. Harry Spence, Sandford, Me.

SPINNING FRAME Thread Guide. 806,024. John E. Tytler and William H. Bowker, Manchester, Eng.

SPINNING MACHINE. 806,068. George J. Cuzner, Miamisburg, Ohio.

SPINNING MACHINE. 806,086. Durell O. Pease, Mannigham, Bradford, England.

SPOOLING MACHINE. 805,265. Charles A. Cowles and Ernest O. Pollard, Ansonia, Conn.

SPINNING MACHINE. 805,238. Sudgen Shackleton, Keighley, England, assignor to Prince Smith & Son, Keighley, England.

SPINNING RING. 807,601. James R. Coe, Ansonia, Conn.

SPINNING RING Polishing Apparatus. 805,245. Frank H. Thompson, Milford, Mass., assignor to Draper Co., Hopedale, Mass.

SPINNING AND WINDING Yarn. Machine for Simultaneously. 805,129. Alfred J. Foulds and Henry A. Foulds, Philadelphia, Pa.

SPINNING AND TWISTING Apparatus. Yarn. 806,737. Desire Despradelle, Boston, Mass., assignor to William A. Stetson, Boston, Mass.

TWISTING APPARATUS. Yarn. 805,752. Alonzo E. Rhodes, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

TEXTILE MACHINERY. Electric Stop Motion for. 12,423. (Reissue.) John B. Whitney, Brooklyn, N. Y.

TEXTILE MACHINERY. Electrical Stop Motion Mechanism for. 12,422. John B. Whitney, Brooklyn, N. Y.

WARP STOP MOTION Mechanism. 805,133. Edmond Guilbert, Woonsocket, R. I., assignor to Draper Co., Hopedale, Mass.

WARPING AND BEAMING Machine. 804,987. James N. Taylor, Paterson, N. J.

WEAVING DIAGRAM and Making Same. 805,244. Jan Szczepanik, Vienna, Austria-Hungary.

YARN. Apparatus for Testing and Registering the Degree of Inequality of. 805,912. Eduard Herzog, Erlach, Austria-Hungary.

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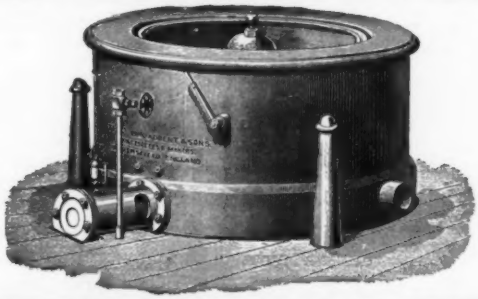

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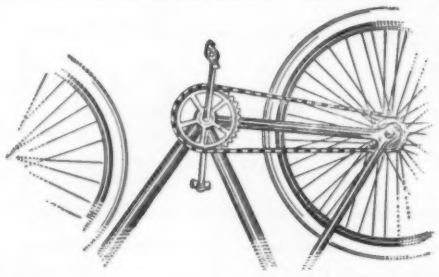

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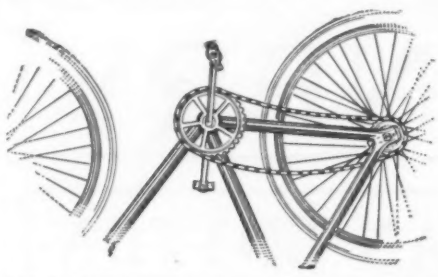

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Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

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Stoddard, Haserick, Richards & Co.

Buttons.
International Button Co.

Calico Printers' Machinery and Supplies.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W. & Sons Co.
Taunton, New Bedford, Copper Co.
Textile Finishing Mchry. Co.
——See also Dyeing, Bleaching, Mary, etc.

Canvas Baskets.
Lane, W. T. & Bro.
Morris & Co.

Carbonizing.
Riverdale Woolen Co.

Carbonizing Machinery.
American Drying Machinery Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.

Card Clothing.
Ashworth Bros.
Bowes, L. M., Co.
Leigh, Evan A.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Card Feeds.
——See Automatic Feeds.

Card Grinding Machinery.
Entwistle, T. C., Co.
Leigh, Evan A.
Riley, C. E. & Co.
Smith & Furbush Machine Co.
Stoddard, Haserick, Richards & Co.

Carders' Tools.
Brown, W. H.

Carpet Machinery.
Altemus, Jacob K.
Curtis & Marble Machine Co.
Parks & Woolson Machine Co.
Philadelphia Textile Machinery Co.
Smith & Furbush Machine Co.

Castings.
Farrell Foundry and Machine Co.
Ferrofix Brazing Co.
Lunkenheimer Co.
Schofield, Wm., Co.

Cement Pans.
Scaife, W. B., & Sons.

Chain Blocks and Hoist.
Yale & Towne Mfg. Co.

Chemicals.
American Chemical Co.
Barrett Mfg. Co.
Roessler & Hasslacher Chemical Co.
Solvay Process Co.

Chemists.
Little, Arthur D.

Cling Surface.
Cling Surface Mfg. Co.

Clocks.
Pettes & Randall Co.

Cloth Boards.
Chaffee Bros.
Pearson, J. T.
Smyth, J. L. N. Paper Co.

Cloth Cutting Machinery.
——See Cutting Machinery.

Cloth Stretchers.
Arlington Mch. Wks. (Arthur Birch, prop.)
Leyland, Thomas & Co.
Textile Finishing Machinery Co.

Clutches.
American Tool & Machine Co.
Humphrey Machine Co.
Hunter, James, Machine Co.
Klein, Chas. C.

Coal Handling Machinery.
Monongahela Mfg. Co.

Comb Aprons.
Turner, J. S., Mfg. Co.

Combs (Wool and Cotton).
Hood, R. H.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Concrete Work and Construction.
Simpson Bros. Corporation.

Conveyors, Pneumatic.
——See Blowers & Blower Systems.

Conveying Machinery and Chains.
Monongahela Mfg. Co.

Cop Spindles.
American Textile Specialty Mchy. Co.

Cop Tubes.
American Textile Specialty Mchy. Co.
——See Paper Tubes.

Copper (Perforated).
——See under Perforated Metal.

Copper Print Rollers.
Rome Metal Co.
Taunton, New Bedford, Copper Co.

Coppersmiths.
Badger, E. B. & Sons Co.
Burkhard, Thomas

Copper Work for Dyers.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

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Corrugated Iron and Steel.
Scaife, W. B., & Sons.

Cotton.
Blaisdell, S., Jr., Co.
Charles, W. B.
Riley, C. E. & Co.
Stoddard, Haserick, Richards Co.

Cotton Elevators.
Buffalo Forge Co.

Cotton Machinery.
Altemus, Jacob K.
American Textile Appliances Co.
American Textile Specialty Mch'y Co.
American Drying Machinery Co.
Ashworth Bros.
Barker, James.
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Cohoes Foundry & Machine Co.
Coldwell-Gildard Co.
Curtis & Marble Machine Co.
Draper Company.
Easton-Burnham Co.
Elliott & Hall.
Entwistle, T. C., Co.
Firth, William, Co.
Hetherington, John & Sons, Ltd.
Howard & Bullough American Mach. Co.
Kilburn, Lincoln & Co.
Kip-Armstrong Co.
Kitson Machine Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Metallic Drawing Roll Co., The.
North Chelmsford Machine Co.
Parks & Woolson Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Providence Machine Co.
Riley, C. E. & Co.
Saco & Pettee Machine Shops.
Schofield, Geo. L.
Smith & Furbush Machine Co.
Stafford, G. W., Mfg. Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whitin Machine Works.
Woonsocket Machine & Press Co.

Cotton Openers and Lappers.
Howard & Bullough American Mach. Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Cotton Softeners.
Bosson & Lane.

Cotton Waste.
Blaisdell, S., Jr., Co.
Charles, W. B.

Crayons.
Dixon, Jos., Crucible Co.
Lowell Crayon Co.

Cutter for Knit Goods.
Eastman Machine Co.
Langston, Samuel M.

Cutting Machinery.
Cameron, James A.
Eastman Machine Co.

Dextrine.
Standard Starch Co.
Stein, Hirsh & Co.

Dobbies.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Stafford, G. W., Mfg. Co.

Drawing Rolls.
Hood, R. H.
Metallic Drawing Roll Co., The.

Dryers.
American Blower Co
American Drying Machinery Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Wks.
Boston Blower Co.
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Sargent's, C. G., Sons.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Vacuum Process Co.

Drying Boards.
Bull, William C.
Pearson, J. T.

Dusters.
——See Wool and Waste Dusters.

Dust Collectors.
Allington & Curtis Mfg. Co.
Philadelphia Drying Machinery Co.

Dyers, Bleachers and Finishers.
Brophy's, T., Sons.
Davidson, J. F.
Fairhill Bleachery.
Fawell, Arthur.
Firth & Foster Co.
Greenwood, R. & Bault.
Home Bleach & Dye Works.
Ingrahamville Dye Works.
Lorimer's, The Wm. H. & Sons Co.
Maryland Bleach & Dye Works.
Pawtucket Dyeing & Bleaching Co.
Peerless Co.
Providence Mills Mfg. Co.
Rowland, Samuel.

Dyeing, Drying, Bleaching and Finishing Machinery.
Alton Machine Co.
Allen, William, Sons Co.
American Blower Co.
American Drying Machinery Co.
American Dyeing Machine Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Beaumont's Limited.
Birch, Arthur, Arlington Mch. Wks.
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Curtis & Marble Machine Co.
Entwistle, T. C., Co.
Fabric Measuring & Packaging Co.
Fries, John W.
Gessner, David.
Heathcote, John & Son.
Hopkins Machine Works.
Kenyon, D. R. & Son.
Klauder-Weldon Dyeing Machine Co.
Klipstein, A. & Co.
Leigh, Evan A.
Leyland, Thos. & Co.
Parks & Woolson Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Rodney Hunt Machine Co.
Smith, Drum & Co.
Sturtevant, B. F., Co. (Drying).
Textile Finishing Machinery Co.
Vacuum Process Co.
Whiteley, William, & Sons, Ltd.

Dye House Cans.
Hill, James, Mfg. Co.

Dye Sticks.
Bailey, Frank.
Haedrich, E. M.

Dye Tubs.
——See Tanks, Tubs and Vats.

Dyestuffs and Chemicals.
American Chemical Co.
American Dyewood Co.
Atteaux, F. E. & Co.
Barrett Mfg. Co.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Cassella Color Co.
Continental Color & Chemical Co.
Kalle & Co.
Ford, J. B., Co.
Fortner, L. B.
Geisenheimer & Co.
Johnson, Chas. A. & Co.
Klipstein, A. & Co.
Leyland, Thos. & Co.
Metz, H. A. & Co.
Roessler & Hasslacher Chemical Co.
Solvay Process Co.
Sykes, Walter F. & Co.
Thayer, Ed. M.
Vila, H. S.
West Indies Chemical Works, Ltd.
Wild, Chas. E.

Dynamos.
——See Electric Lighting.

Edgings.
——See Tapes, Braids and Edgings.

Electrical Construction.
Crocker, Wheeler & Co.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Cloth Cutter.
Eastman Machine Co.

Electric Fans.
American Blower Co.
Buffalo Forge Co.
Crocker-Wheeler Co.
General Electric Co.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Lamps.
Sturtevant, B. F., Company.

Electric Lighting.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Motors.
Crocker-Wheeler Co.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Elevators.
Cohoes Foundry & Machine Co.
Salem Elevator Works.

Embroidery Machines for Hosiery and Knit Goods.
Walther, Otto.

Employees' Time Recorders.
Pettes & Randall Co.

Engine Stops.
Consolidated Engine Stop Co.

Engineering Specialties.
Lunkenheimer Company.

Engineers' Supplies.
Lunkenheimer Company.

Engravers.
Smith Bros.

Exhaust Heads.
Sturtevant, B. F., Co.

Fans—Exhaust and Ventilating.
——See Ventilating Apparatus.

Feed Water Heaters.
Green Fuel Economizer Co.
Murray Iron Works Co.
Scaife, W. B. & Sons.

Feed Water Pumps.
Goulds Mfg. Co.
Murray Iron Works Co.
Scaife, W. B. & Sons.

Feed Water Purifiers.
Philadelphia Water Purification Co.
Scaife, W. B., & Sons.

Feeds.
——See Automatic Feeds.

Felt Hardeners.
Farrell Foundry and Machine Co.

Felting Machinery.
Farrell Foundry and Machine Co.

Filters.
Norwood Engineering Co.
Phila. Water Purification Co., The.
Scaife, W. B. & Sons.

Finishing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.

Fire Box Blocks.
McLeod & Henry Co.

Fire Box Blocks, "Steel Mixture."
McLeod & Henry Co.

Fire Brick.
Borgner, Cyrus, Co.
McLeod & Henry.

Alphabetical Advertising Index, with page numbers, follows this list.

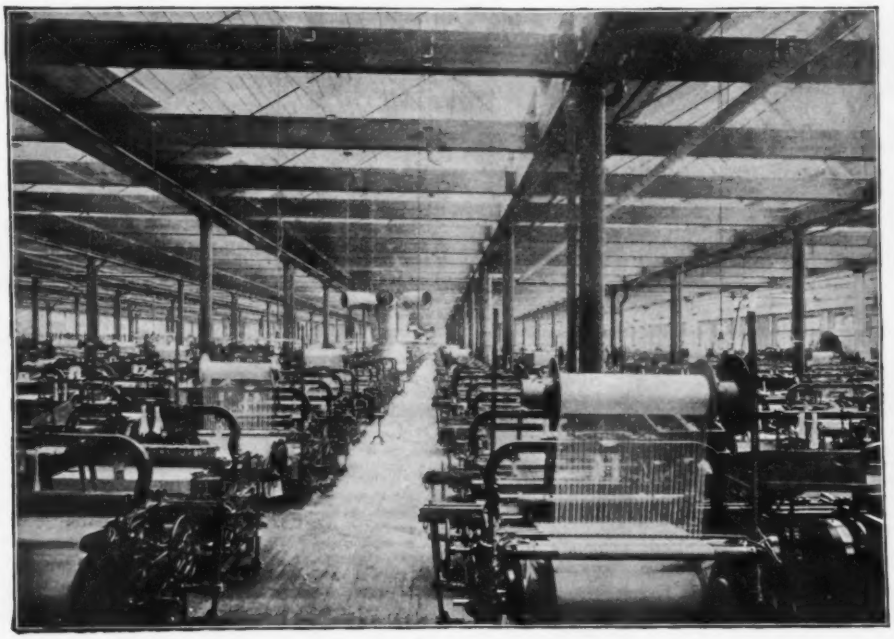
TEXTILE MILLS

are thoroughly and economically

Heated and Ventilated

by the

STURTEVANT SYSTEM



WEAVE SHED, SOULE MILL, NEW BEDFORD, MASS.

This extensive weave shed is heated and ventilated by the Sturtevant System. Stand pipes admit air under pressure and distribute it throughout the building; equal heating results. With this system exhaust steam is utilized, humidity regulated and the quantity and quality of the air varied at will. There are no scattered steam pipes, the whole apparatus being centralized and under one man's control.

B. F. STURTEVANT CO., BOSTON, MASS.

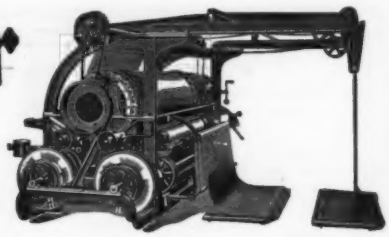
General Office and Works, Hyde Park, Mass.

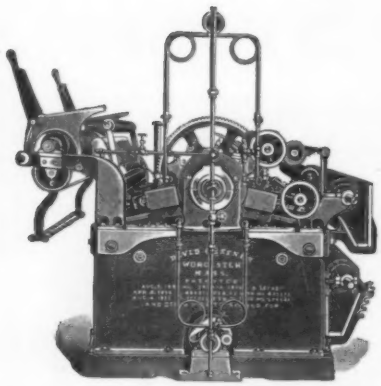
New York Philadelphia Chicago London

Designers and Builders of Heating, Ventilating, Drying and Mechanical Draft Apparatus; Fans, Blowers and Exhausters; Steam Engines, Electric Motors and Generaitng Sets; Fuel Economizers; Forges, Exhaust Heads, Steam Traps, Etc. 370

David Gessner

Worcester, Mass.

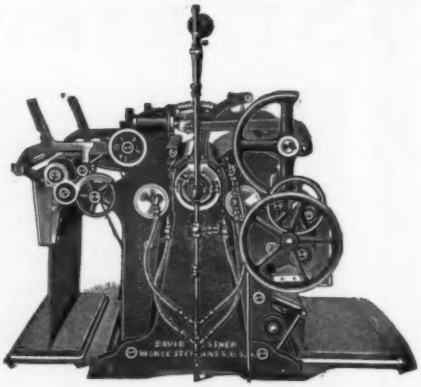




Latest Improved Cloth Finishing Machinery

—

Napping Machines and Presses a Specialty



Fire Extinguishers.
Badger, E. B. & Sons Co.
Carbondale Chemical Co.

Fire Hose.
Eureka Fire Hose Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Proof Doors and Windows.
Badger, E. B. & Sons Co.

Fire Pumps.
—See Pumps.

Flax, Tow, Hemp and Jute Machinery.
Fairbairn-Lawson-Combes-Barbour, Ltd.

Fluted Rolls.
Hood, R. H.
Leigh, Evan A.
Riley, C. E. & Co.
Thurston, A. G. & Son.

Flyers.
Bodden, Wm., & Son, Ltd.
Hopkins Machine Works.
Leigh, Evan A.

Forges.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Forwarders.
Salvator Transfer, Inc.

Friction Clutches.
—See Clutches.

Friction Cones.
Evans, G. Frank.

Fuel Economizers.
Green Fuel Economizer Co.
Sturtevant, B. F., Co.

Fulling Mills for Woolen Goods.
Hunt, Rodney, Machine Co.
Hopkins Machine Works.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.

Garnetts.
Garnett, P. & C., Ltd.
Leigh, Evan A.
Smith & Furbush Machine Co.

Gas Blowers and Exhausters.
Sturtevant, B. F., Co.

Gas Engines.
Jones, Lewis.

Gaskets—Copper.
Goetz, Frederick

Gassing Machines.
Stubbs, Joseph.

Gauges.
Crosby Steam Gage & Valve Co.
Lunkenheimer Co. (all kinds).
Walworth Manufacturing Co.

Gears.
Farrell Foundry and Machine Co.
New Process Raw Hide Co.

Gear Cutting.
Farrell Foundry and Machine Co.

Gear Cutting Machine.
Whiton, The D. E., Co.

Generating Sets.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Grate Bars.
Tupper, W. W., & Co.

Grease.
Cook's, Adam, Son.

Guides.
Mitchell-Bissell & Co.

Heating.
—See Ventilating.

Heddles.
Steel Heddle Mfg. Co.
Stoddard, Haserick, Richards & Co.

Hoisting Apparatus.
Economy Engineering Co.
Yale & Towne Mfg. Co.

Hosiery Boards.
Pearson, J. T.

Hosiery Labels.
Beck, Charles Paper Co.
Kaumagraph Company.

Humidifying Apparatus.
American Moistening Co.
Bell Pure Air & Cooling Co.

Hydraulic Rams.
Power Specialty Co.

Hydro Extractors.
American Tool & Machine Co.
Broadbent, Thomas, & Sons.
Riley, C. E. & Co.
Rodney Hunt Machine Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.

Injectors.
Lunkenheimer Co. (all kinds).

Insulating and Braiding Silks.
Sauquoit Silk Mfg. Co.

Ironing Machines for Knit Goods.
Craw, J. W., Laundry Machinery Co.

Jack Spools.
Sweet & Doyle.

Jacquards.
Halton's, Thomas, Sons.

Knit Goods, Edgings, Trimmings, Etc.
Cathcart, John & Co.
Chapin, Geo. W.
Charles, W. B.
Cheney Bros.
Friedberger-Aaron Mfg. Co.
Hepner & Horwitz.
International Button Co.
Krout & Fite Mfg. Co.
Weimar Bros.

Knit Goods, Finishing Machines, Crochet, Etc.
Craw, J. W., Laundry Machinery Co.
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Nye & Tredick Co.
Rodney Hunt Machine Co.
Scott & Williams.
Union Special Machine Co.
Wilcox & Gibbs Sewing Machine Co.

Knitting Machine Cylinders.
Paxton & O'Neill.
Stafford & Holt.

Knitting Machinery.
Boss Knitting Machine Co.
Brinton, H. & Co.
Claes & Flentje.
Cooper, Chas.
Crane Mfg. Co.
Excelsior Knitting Machine Mfg. Co
Gormley, R. W. & Co.
Grosser Knitting Machine Co.
Guenther, Max.
Hilscher, G.
Jenckes, E., Mfg. Co.
Jones, Lewis.
Koch, Edward W.
Lamb Knitting Mach. Mfg. Co.
Leighton Machine Co.
Mayo, Geo. D., Knitting Machine Co.
Mayo Knitting Machine & Needle Co.
National Automatic Knitter Co.
Nye & Tredick Co.
Paxton & O'Neill.
Scott & Williams.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros.
Walter & Co.
Walther, Otto.
Wildman Mfg. Co.

Knitting Needles and Supplies.
Breedon's, Wm., Son.
Brinton, H. & Co.
Continental Latch Needle Company.
Cooper, Chas.
Corey, Wm., Co.
Crane Mfg. Co.
Dodge Needle Co.
Excelsior Needle Co.
Grosser Knitting Machine Co.
Guenther, Max.
Ives, Loyal T.
Kolb, Frank E.
Lamb Knitting Machine Mfg. Co.
Manufacturers' Supplies Co.
Mayo Knitting Machine & Needle Co.
Page Needle Co.
Treat, Orion.
Wardwell Needle Co.

Labeling Machines.
Beck, Chas., Paper Co., Ltd.

Lamps, Incandescent.
General Electric Co.
Sawyer-Mann Electric Co.
Westinghouse Electric & Mfg. Co.

Leather.
Bowes, L. M., Co.

Loom Pickers.
Garland Mfg. Co.

Loom Repairs and Parts.
Glaser Mfg. Co.

Looms.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Draper Company.
Kilburn, Lincoln & Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Stafford, G. W., Mfg. Co.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.

Loopers.
Hepworth, John W. & Co.
Leighton Machine Co.

Lubricators.
Cook's, Adam, Son.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.
Lunkenheimer Co.

Lumpers.
Gerry, George & Son.
Schofield, Wm., Co.

Machinery Dealers.
Jefferson, Ed. & Bro.
Lamb, J. K., Textile Mach. Co.
Schofield, Geo. L.
Stead, Arthur.
Taylor, James.

Machinists' Tools.
Whitin, The D. E. Co.

Mails.
Walder, J.

Measuring and Folding Machines.
Curtis & Marble Machine Co.
Elliott & Hall.
Fabric Measuring & Packaging Co.
Parks & Woolson Machine Co.

Mechanical Draft.
American Blower Co.
Boston Blower Co.
Buffalo Forge Co.
Green Fuel Economizer Co.
Massachusetts Fan Co.
Sturtevant, B. F., Co.

Mechanical Engineers.
American Blower Co.
Buffalo Forge Co.
Dean & Main.
Glaser Mfg. Co.
Murray Iron Works Co.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.

Mercerizers.
Greenwood & Bault, R.
Home Bleach & Dye Works.
Lorrimer, Wm. H., Sons Co.
Luzern Cotton Yarn Co.

Mercerizing Machinery.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W. & Sons.
Klauder-Weldon Dyeing Machine Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.
Whiteley, William & Sons, Ltd.

Metallic Fire-proof Window Frames and Sashes.
Badger, E. B. & Sons Co.

Metallic Packing.
Power Specialty Co.

Mill Architects.
—See Architects and Mill Engineers.

Mill Brushes.
—See Brushes.

Mill Builders and Engineers.
Ferguson, John W.

Mill Sewing Machines.
—See Sewing Machines and Supplies.

Mill Supplies.
American Supply Co.
Bamford & Smith.
Barker, James.
Buckley's, Benj., Son, Gun Mill.
Crosby Steam Gage and Valve Co.
Easton-Burnham Co.
Eureka Fire Hose Co.
Garland Mfg. Co.
Glaser Mfg. Co.
Jefferson, Ed. & Bro.
Lane, W. T. & Bro.
Leigh, Evan A.
Lunkenheimer Company.
Main Belting Co.
Morris & Co.
Murphy, E. W. & Co.
Patterson, Gottfried & Hunter, Ltd.
Philadelphia Drying Machinery Co.
Riley, C. E. & Co.
Richardson Bros.
Shaw, Victor, Ring Traveler Co.
Stephenson Mfg. Co.
Stoddard, Haserick, Richards & Co.
Thurston, A. G. & Son.
Tucker, W. W. & C. F.
Turner, J. S., Mfg. Co.
Ward & Vandegrift.
Walworth Manufacturing Co.

Motors.
—See Electric Motors.

Napping Machinery.
American Napping Machine Co.
Borchers, Richard C. & Co.
Curtis & Marble Machine Co.
Gessner, David.
Jones, Lewis.
Leigh, Evan A.
Parks & Woolson Machine Co.
Whiteley, William & Sons, Ltd.

Noils (Silk).
Malcolm Mills Co.
Ryle, Wm. & Co.

Office Supplies.
Niagara Clip Co.

Oil Cups.
Lunkenheimer Co.
Tucker, W. & C. F.
Walworth Manufacturing Co.

Alphabetical Advertising Index, with page numbers, follows this list.

Why "Sable" Rawhide Belting Has Greater "Pulling" Power Than Oak-Tanned.

It is no secret that Shultz Belting is tanned only on the surface, but the Shultz method of tanning and treating the rawhide is a secret. And this secret process produces a surface which is of exactly the right nature to cause the belt to hold fast to the pulley stubbornly against the tendancy to slip, whether the belt is tight or loose. As proof that the Schultz method of tanning is an exclusive one, "Sable" belting transmits 33% more power than oak-tanned belt.

Still another reason for tanning only the surface is to retain the whole original strength and pliability of the interior rawhide. That is why "Sable" gives much longer service that the average belt. We'll send a belt on 60 days' trial. There's a good "Sable" Belt story in Booklet No. 6.

SHULTZ BELTING CO., St. Louis, Mo.

New York: 111 Chambers St. Boston: 114 High St. Philadelphia: 116 North Third St.

Oils.
Borne, Scrymser Co.
Cook's, Adam, Son.
Excelsior Wool Oil Compound Co.
Murphy, E. W. & Co.
New York & New Jersey Lubricant Co.
Stephenson Mfg. Co.

Oil Hole Covers.
Tucker, W. W. & C. F.

Oil Purifiers.
Patterson, Gottfried & Hunter, Ltd.

Olive Oil and Olive Oil Foots.
Dewsnap, John B., & Company.

Overhead Tracks.
Cohoes Foundry & Machine Co.

Overseaming Machines.
Merrow Machine Co.
Willcox & Gibbs Sewing Machine Co.

Packing.
Goetz, Frederick

Pantagraphs for Mill Engraving.
Johnson, C. A. & Co.

Paper.
Richardson Bros.
Smyth, J. L. N. Paper Co.

Paper Boards.
Smyth, J. L. N. Paper Co.

Paper Box Machinery.
Beck, Chas., Paper Co., Ltd.
Langston, Samuel M.

Patent Solicitors.
Crosby & Gregory.
Howson & Howson.

Perforated Metals.
Hopkins Machine Works.

Peroxide of Sodium.
Roessler & Hassiacher Chemical Co.

Pipes and Fittings.
Pancoast, Henry B. & Co.
Scaife, W. B., & Sons.
Walworth Manufacturing Co.

Pneumatic Conveying.
——See Ventilating.

Porcelain Guides.
Mitchell-Bissell & Co.

Power Transmission Machinery.
American Drying Machinery Co.
American Mfg. Co.
American Pulley Co.
Cohoes Foundry & Machine Co.
Evans, G. Frank.
Farrell Foundry and Machine Co.
Hunter, Jas., Machine Co.
Kilburn, Lincoln & Co.
Klein, Chas. C.
Philadelphia Drying Machinery Co.
Plymouth Cordage Co.
Rodney Hunt Machine Co.
Saginaw Manufacturing Co.
Schofield, Wm., Co.
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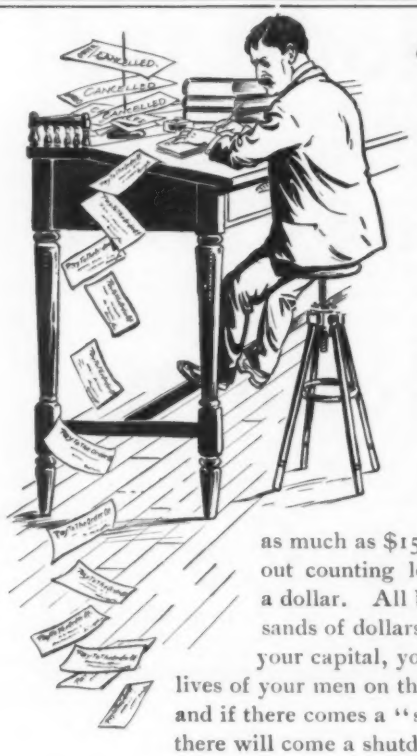

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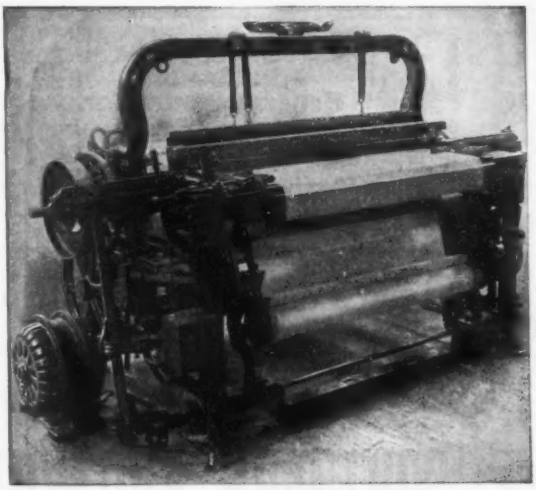

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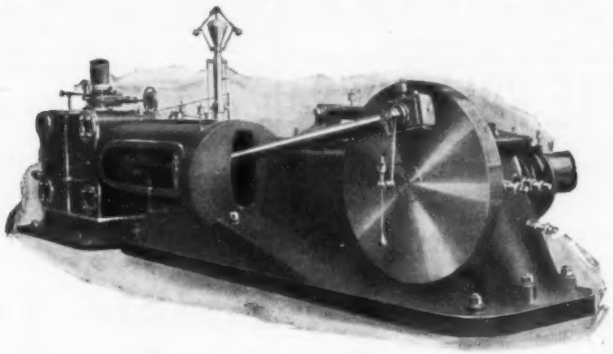

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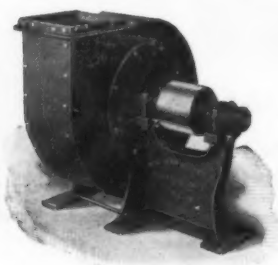

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Woolen Superintendent or overseer of dyeing or finishing. Worked on all kinds of woolen goods, worsted and union. Age 39. Will not go South or West. First-class references. 1210, Textile World Record.

Worsted Superintendent or overseer of combing, spinning and twisting. Worked on mohair, alpaca, all foreign and domestic wools. Familiar with all kinds of machinery; first-class references. Age 45, married. 3248, Textile World Record.

Asst. Superintendent or Overseer. 20 years' experience as overseer in both England and Scotland over combing, drawing, spinning, etc. Can work both long and short wools, get up all kinds of mixtures, instruct the shading of batches, etc. Has good references. 43 years of age. 3086, Textile World Record.

WOOLEN SUPERINTENDENTS.

Assistant Superintendent. Worked on Woolens and worsteds of all kinds. Graduate of a Textile School. American; 23 years of age; single. 3228, Textile World Record.

Superintendent or Manager. Over 35 years' mill experience; last 20 years as superintendent; active, energetic, competent and excellent manager of help. Understands all raw materials, wool, cotton, shoddy, and their values. Also understands carbonizing. Could take a position at short notice. 3279, Textile World Record.

Woolen Superintendent and designer. Worked on men's wear, worsteds, fancy cassimeres, smoking jackets, over-cloth, ladies' dress goods. 28 years of age; English; single. 3234 Textile World Record.

Superintendent of small woolen mill. Piece dyed goods, thibets, Venetians, meltons, etc. 3114, Textile World Record.

Assistant Superintendent, Woolen. American, 24 years of age. Worked on woolen and worsted suitings and dress goods. Prefers position in the East. 3421, Textile World Record, Boston.

Superintendent Shoddy Mill or Wool Carder would accept position as shoddy salesman. Worked on all kinds of yarns and shoddies, on Jas. Smith, D. & F., Lombard, Furbush & Son machines. Prefers a position in Mass. 3419, Textile World Record, Boston.

Superintendent and Designer or Agent. American, 41 years of age, has worked in nearly every department of a woolen mill and thoroughly understands his business. On all classes of wool and worsteds, dress goods, broadcloths, overcoatings, rain cloths, meltons, army goods, etc., and on all the best makes of machinery. Wants position in the States. 3416, Textile World Record, Boston.

Superintendent of Woolen Mill. American, 36 years of age, with experience as superintendent and manager 10 years. Accustomed to unions, satinets, beavers, cloakings, dress goods, etc., and the machinery used in this work. A1 references. 3410, Textile World Record, Boston.

Superintendent or Assistant, Designer or Boss Weaver, 33 years of age, with experience on woolen and worsteds for men's and women's wear, and on D. & F., Crompton and Knowles, and all kinds of finishing machinery. Go anywhere for good position. 3388, Textile World Record, Boston.

Superintendent or Designer. American, 37 years of age, married, wants a position in United States. Worked on light and heavy weight woolen and worsted goods, fancy and plain, wool and worsted piece dyes, also pebble worsteds. Been superintendent 6 years and designer 8. 3353, Textile World Record, Boston.

Superintendent or Assistant Superintendent. Worked on fancy and piece dye dress goods, fancy suitings and overcoatings in some of the best New England mills. Experienced in details of manufacturing and cost calculation. Young man, American, married. Best references as to character and executive ability. 3360, Textile World Record.

Agent or Superintendent of woolen or worsted mill. First class man, American, 35 years of age, is seeking position in the East. Understands business thoroughly. Accustomed to all grades men's wear, woolen and worsted, fancy and piece dyes, also dress goods, shawls, steamer rugs, etc. 3377, Textile World Record, Boston.

Superintendent or superintendent and designer. 45 years of age, with experience on fine fancy worsteds and piece dyes, fancy and piece dye cheviots, fancy woolens and worsteds, also mercerized piece dyes. Understands silk manufacture also. 3382, Textile World Record, Boston.

COTTON SUPERINTENDENTS.

Superintendent of a Cotton Mill; 45 years of age; married; Scotch; familiar with fancy ginghams, denims, flannels, and all kinds of sheeting. Has first-class references. 3318, Textile World Record, Boston, Mass.

Superintendent or boss carder of carding and spinning in cotton mill. Familiar with all kinds of cotton yarns, including high and low stock; familiar with combs; first-class references; 36 years of age; married. 3290, Textile World Record, Boston, Mass.

Superintendent in a Cotton Mill or overseer of carding in a large mill. Would prefer a position in Alabama. 42 years of age; American; familiar with both yarns and cloth. Worked in mills that have made yarns from 7s to 100s, American and Egyptian cotton. Has first-class recommendations. Could take a position at short notice. 3304, Textile World Record, Boston, Mass.

Superintendent of broad silk mill wants position. Age 39; English; married. Worked on mostly plain goods. Could be of good service to some reliable concern just starting up. Has small plant of his own which he would put in as stock with a first-class concern. 3154, Textile World Record.

Superintendent. Would like position in South. Not particular about salary to start. Machinist and thoroughly acquainted with all kinds of card room machinery, also spinning frames. Taken superintendent course in textile school and has had 23 years of practical experience in the mill, mostly on fine yarn work. 3044, Textile World Record.

Superintendent of cotton mill or overseer. Handled all kinds and numbers in yarn mills, cloth mills, colored warps, etc. Speeder, warper, spooler and spinner in the family. Age 48; American; married. 3219, Textile World Record, Boston, Mass.

Cotton Superintendent. Has been boss carder, ring spinner and comber on all kinds of cotton yarns, hosiery yarn a specialty. First-class references. Age 44, married. 3025, Textile World Record.

Cotton Superintendent or assistant superintendent. Worked on linen and union towels and crashes. Father now taking full charge of the business, so he is not needed. Worked on Crompton & Knowles and other machinery used in toweling manufacture. Age 28, first-class reference. 1867, Textile World Record.

Cotton Superintendent wants position. Now engaged, but wishes to change to better condition. Worked on all kinds of plain cotton goods, prints, sheetings, ginghams, etc. Familiar with all kinds of cotton machinery. Will not go West, South or Canada. Age 43, married, first-class references. 2005, Textile World Record.

Superintendent or Superintendent and Designer in a cotton mill. Familiar with all lines of colored and cotton tickings, denims, shirtings, ginghams, lappet and dress goods. Worked on English and American machinery. 36 years of age, married. First class recommendations. 3331, Textile World Record, Boston.

Superintendent or Boss Weaver. American, with 15 years' experience, wants first class position in New England. Understands nearly all cotton looms, also slashing, beaming and quilling. Worked on jacquards, lenos, fancies, lappets, box work and plain. 3351, Textile World Record, Boston.

Superintendent of yarn mill or plain cotton weaving or assistant. 33 years of age; American. Worked on all classes of yarn up to 50s and plain weaving. Married. 3226, Textile World Record.

Cotton Mill Superintendent. Overseer of weaving on mule spindles. Worked on fancy lenos, jacquards, fancy lappets, plain, fine and coarse cotton goods. Age 36; French-American. 3232, Textile World Record.

Superintendency of cotton mill wanted by a thoroughly practical cotton manufacturer of over 20 years' experience. Age 38; married. Temperate. Good manager. Fully competent to obtain full production at minimum cost and maintain best selling qualities. Highest references given. 1236, Textile World Record.

COTTON SUPERINTENDENTS.

Assistant Superintendent, or a good overseer's position. Worked on all kinds of filling warp, colored hosiery, mercerized thread, twist and ply yarns. Taken a course in designing, combing and weaving in textile school. Age 35, married. First-class references. 1957, Textile World Record.

Cotton Superintendent, worked on all kinds of sheetings, sateens; all kinds of fancies, lenos and lappets, Jacquard, cotton and silk mixed. Age 35, first-class references. 1934, Textile World Record.

Cotton Superintendent or overseer of carding. Worked on all white goods yarns from 12s to 150s. Familiar with the Lowell, Saco & Pettee revolving flat cards. Age 37, married; first-class references. 1898, Textile World Record.

Cotton Superintendent of a yarn mill. Familiar with all kinds of yarns, from 20s to 120s. Used to all kinds of American and English machinery. Age 39, married; first-class references. 1364, Textile World Record.

Cotton Superintendent, or superintendent and designer. Worked on all kinds of cotton, from 20s to 150s. Also large experience on lenos and other fancy goods. Some knowledge of Jacquards. All kinds of cotton machinery. Age 39, married. 2080, Textile World Record.

Cotton Superintendent. Yarn or weaving mill. Worked on all kinds of yarn, from 10s to 170s. Also all kinds of plain cotton goods. Age 37, married. 1027, Textile World Record.

Cotton Superintendent. Worked on dress goods, shirtings, skirtings, ginghams, cotton flannels and blankets. Familiar with all kinds of cotton machinery. Age 37, married; first-class references. 1432, Textile World Record.

Cotton Superintendent, now employed, but wishes to change. Worked on all classes of fancy lawns, sateens, twills, drills, denims, tickings, awnings, ducks, chambray and fancy dress goods. Familiar with all kinds of machinery. Age 38, married. 1226, Textile World Record.

Superintendent of cotton mill, spinning or weaving, assistant superintendent or designer or overseer of weaving, plain or fancy goods. Age 28; English; married; first-class references. 3243, Textile World Record.

Assistant Superintendent in an up-to-date cotton mill. Age 26 years. Textile school education. Single, hard worker and of good habits. Would invest in a paying proposition. 3239, Textile World Record.

Superintendent of cotton weaving and spinning mill. English. Quilts, damasks, brocades, ribbons, etc. 3175, Textile World Record.

Superintendent Small Yarn Mill. American, 25 years of age; worked on carded yarns 8s to 60s, American cotton, white goods only. Also on all makes American machinery. Would accept position as carder, weaver or designer, where there was a chance for advancement. 3392, Textile World Record, Boston.

Superintendent and Designer, or Designer. Young man, American, with 4 years' experience as designer. Worked on shirting and all kinds of elastic and non-elastic webs, on Crompton and Knowles, broad and narrow looms. Will accept a good position anywhere in United States. 3359, Textile World Record, Boston.

Superintendent or assistant of silk or cotton mill. Worked on plain and fancy ribbons and all classes of goods in broad silks, dress silks and tie silks, also Jacquard work. References. 3185, Textile World Record.

Superintendent of bleaching. Worked on all kinds of lawns, lenos and colored lenos, towels, colored and white, ducks, drills, sateens, tickings. Age 55; English; married. First-class references. 3245 Textile World Record.

Superintendent of bleaching and finishing cotton goods. Worked on all kinds of cheese cloth, buttercloth, sheetings, quilts, cambrics, long cloth, ducks and drills. Age 31; English; married. 3218, Textile World Record, Boston, Mass.

Superintendent of cotton bleachery is open to a position. Excellent experience. American; married; aged 37. Familiar with cambrics, sheetings, shirtings, lawns, sateens, drilling and fancy weaves. 3153, Textile World Record.

WOOLEN CARDERS.

Overseer of Woolen Carding. American, 28 years of age, with experience as second hand and overseer in some of the largest mills in New England, wants position in the East. Worked on all classes of woolen goods, and on nearly all makes of woolen cards. 3355, Textile World Record, Boston.

Overseer of Carding. American, 40 years of age, with 8 years' experience as overseer, accustomed to all grades woolen and cotton and shoddy mixes, and to all kinds of woolen carding machinery, wants position in the Nqrth. 3358, Textile World Record, Boston.

Overseer of Carding. Age 26, American, unmarried, with 7 years' experience as overseer, wants position in New England. Had experience on wool, shoddy, silk noils, etc. Understands D. & F., Furbush and Cleveland cards. 3339, Textile World Record, Boston.

Overseer of Woolen Carding. American, 35 years of age, with nearly 15 years' experience as overseer, wants position in the East. Accustomed to cassimeres, cheviots, carriage cloth, blankets, etc., and nearly all machinery used in card room. 3342, Textile World Record, Boston.

Boss Carder in a woolen mill. Worked on all wools, cotton and shoddy mixes, and is familiar with Davis & Furber and Cleveland cards, and all makes of rub aprons and different rub rolls. 29 years of age, American, first-class references. No. 3284, Textile World Record, Boston.

Boss Carder or Spinner. Familiar with all kinds of American machinery, including Davis & Furber cards and mules; also Johnson & Bassett mules. Worked on all kinds of stock from the lowest to the finest grades of wool. 54 years of age; first-class recommendations. 3288, Textile World Record, Boston, Mass.

Boss Carder in a woolen mill. Worked on all grades of woolens, cotton and shoddy mixes. Familiar with all kinds of American machinery. First-class references; 31 years of age; German. 3316, Textile World Record, Boston.

Boss Carder in a Woolen Mill. Worked on satinets, cotton mixed dress goods, kerseys, etc. Could take a position at short notice; 34 years of age; Irish-American. 3319, Textile World Record, Boston, Mass.

Boss Carder and Spinner. Worked on all kinds of woolen and cotton and shoddy mixes; also knitting yarn. Familiar with Davis & Furber cards and mules, Johnson and Bassett, Lombard and Cleveland cards and mules. First-class recommendations; 36 years of age; American. 3302, Textile World Record, Boston, Mass.

Overseer of Carding. American, with experience, wants first class position. Worked on nearly all classes of woolen goods and on machinery used in woolen card room. Best of references. Wants position in the North. $4.00 per day. 3361, Textile World Record, Boston.

Overseer of Carding. American, 27 years of age, wants a position in the East. Is familiar with all kinds of machinery in woolen card room and with cloth for men's and women's wear. 3365, Textile World Record, Boston.

Overseer or Second Hand in card room. 24 years of age. Started as boy in card room. Accustomed to cassimeres, cotton and wool mixes, noils and the lowest grade of goods. Davis and Furber and other makes of machinery. 3371, Textile World Record. Boston.

Overseer of Carding. American, 36 years of age, with 6 years' experience as overseer. Has been working in large mills in Massachusetts and brings good references. Worked on all grades wool, cotton and shoddy mixes. Good manager of help and would consider a first class second hand's position. 3375, Textile World Record, Boston.

Overseer of Carding. 32 years of age, with 16 years' experience in one mill, making all classes of men's wear. Had two years' experience as overseer. Accustomed to D. & F. Cleveland and Furbush cards. 3381, Textile World Record. Boston.

Boss Carder in Woolen Mill, or would take a good second hand position. Worked on Davis & Furber and Lombard cards. First-class recommendations; 49 years of age; English. 3297, Textile World Record, Boston, Mass.

WOOLEN CARDERS.

Secondhand in wool card room. Age 23; American. Wool and cotton mixes. References. 3198, Textile World Record.

Second Hand of scouring and carding worsted in a large mill, or overseer in a small mill. Age 24; American; single. First-class references. 3246, Textile World Record.

Woolen Boss Carder. Worked on all classes of goods in hosiery and woolen mill. Familiar with Davis & Furber, Furbush & Cleveland cards; first-class references. Age 35, married. 1501, Textile World Record.

Woolen Boss Carder, or would accept a position as traveling machinist in setting up machinery. Worked on all classes of woolen goods, shoddy mixes, cotton mixes. Worked on Davis & Furber, Cleveland, Lombard, Platt Bros., Furbush & Smith machines. First-class references; age 47; married. 1578, Textile World Record.

Woolen Boss Carder. Worked on all classes of woolen goods, hosiery, dress goods, felts, blankets, cassimeres, satinets, slasher and roller cloth. Age 38; first-class references. Could take a position at short notice. 3258, Textile World Record.

Boss Carder or Superintendent of a shoddy mill. Familiar with all kinds of stock from highest to the lowest grades. All makes of woolen carding machinery. 30 years of age; married; American. 3307, Textile World Record, Boston, Mass.

Boss Carder in Woolen Mill. Familiar with all kinds of woolen shoddy and cotton mixed goods; also knitting yarn. Familiar with all kinds of American carding machinery and first-class recommendations. 45 years of age; Irish-American. 3313, Textile World Record, Boston, Mass.

Boss Carder in Woolen Mill. Worked on all kinds of woolen goods; familiar with Davis & Furber and Platt, Cleveland and Furbush machinery. First-class references; 26 years of age; German. 3298, Textile World Record, Boston, Mass.

Woolen Boss Carder. Worked on all classes of union, cassimeres, beavers. Familiar with all classes of stock. Will not go West. Age 35, married; first-class references. 3174, Textile World Record.

Boss Carder and Spinner in a Woolen Mill, or would accept a position as superintendent in small blanket or flannel mill. 54 years of age; English, first-class recommendations. 1798, Textile World Record, Boston, Mass.

Boss Carder and Spinner in a Woolen Mill. Familiar with all grades of woolen and mixed goods. Familiar with all makes of American carding and spinning machinery. Will not go West or South; 40 years of age; first-class recommendations; American. 3294, Textile World Record, Boston, Mass.

Overseer of Woolen Carding. First-class man, with experience in large mills. Accustomed to any class stock that can be carded on woolen cards, and to all machinery used in this work. Go anywhere on month's trial. Satisfaction guaranteed. 3394, Textile World Record, Boston.

Overseer of Carding in Knitting Mill. American, 36 years of age; accustomed to knit underwear, both cotton and wool; experience on Davis and Furber and Smith cards. Was 5 years second hand in one mill and for the past 6 years has been overseer. 3391, Textile World Record, Boston.

Overseer of Woolen Carding. American, 44 years of age, with experience in large mills in New York State. Has worked on all classes of woolens and worsteds and hosiery. Best of references. 3389, Textile World Record, Boston.

Overseer Woolen Carding or Carder and Spinner. Englishman with experience on all grades of stock; understands Cleveland, Lombard's, D. & F., Furbush & Sons machines. Prefers a position in the East. 3404, Textile World Record, Boston.

Overseer of Woolen Carding. American, 30 years of age, married; worked on nearly all classes of woolen goods and all machinery used in this work. Prefers West or Middle West. 3170, Textile World Record, Boston.

Master Mechanic in cotton or woolen mill or cotton finishing plant. American; married. Good experience and reference. 3189, Textile World Record.

Overseer of dressing. American. Married. Wool, worsted and cotton worsteds. 3165, Textile World Record.

WOOLEN WEAVERS.

Boss Weaver, second hand or loom fixer. Age 30; married. Wants $3 per day. Men's wear, dress goods and all kinds of fancy worsteds. Crompton & Knowles looms. Reference. 3182, Textile World Record.

Boss Weaver and designer. All grades of fancy dress goods, woolen and worsted, cotton and cotton mix kerseys, coverts and venetians. Plain and fancy men's wear. 3181, Textile World Record.

Woolen Boss Weaver. Worked on worsteds, woolens of all kinds, also dress goods. American; 38 years of age; married. 3231, Textile World Record.

Woolen Boss Weaver. Worked on plain and fancy piece dyed worsted, woolen, plain and fancy flannels, also fancy mercerized rain cloths. 29 years of age; Canadian; married. First-class references. 3251, Textile World Record.

Young Man, American, wants position as boss weaver or assistant superintendent. Has worked on fancy worsteds, cassimeres and cheviots. Can also design. 1712, Textile World Record.

Overseer of Weaving or designer. Familiar with all kinds of dress goods, lenos, lappets or any kind of fancy Jacquard weaving. Understands all kinds of English and American machinery. Age 46, English. First-class references. 3267, Textile World Record.

Overseer of Weaving. Worked on worsteds, cassimeres, dress goods, and all kinds of woolen goods. Crompton & Knowles looms. First-class references; American. 45 years of age. 3262, Textile World Record.

Boss Weaver in a woolen mill. Worked for the past twenty years in one of the best woolen mills in Massachusetts and eight years in the same mill for a former company. 57 years of age, married, English, first-class references. No. 3270, Textile World Record, Boston.

Overseer of Weaving, or would consider a good loom fixing job in a woolen mill. Age 47; Protestant; good references. 3247, Textile World Record.

Overseer of Weaving. 40 years of age, with 20 years' experience fixing and weaving in New England. Understands plain and fancy woolens and worsteds. Crompton and Knowles looms. Good references. 3369, Textile World Record, Boston.

Overseer of Weaving. 36 years of age, with 18 years' experience in a large mill in Massachusetts. Accustomed to woolens and worsteds, high and low grade, and to all machinery used in weave room. Prefers position in or about New England. 3373, Textile World Record, Boston.

Overseer of Weaving, or weaver and designer. American, 40 years of age, with experience on all grades men's wear and all makes of woolen looms, pickers, spoolers, twisters, etc., wants a position in the East. 3379, Textile World Record, Boston.

Boss Weaver in a Woolen Mill, or a fixing job with chance of advancement. Worked on worsted dress goods, cassimeres and cotton warp goods, beavers, etc. First class recommendations; 32 years of age, American. 3329, Textile World Record, Boston, Mass.

Boss Weaver in a Woolen Mill or superintendent of small mill. Worked on ladies' dress goods, men's wear, flannels, blankets, Indian robes, both jacquard and chain loom work. 38 years of age; married; first-class references. 3324, Textile World Record, Boston, Mass.

Boss Weaver in Woolen Mill, or would accept a good loom fixing position. Worked on satinets, cotton and woolen warp goods, sheetings, shirtings and ducks. Also worked on cotton and woolen jute bagging. 45 years of age. 1806, Textile World Record, Boston, Mass.

Overseer of Woolen Weaving or boss dressing. Worked on all kinds of woolen and worsted dress goods. A good manager of help. Could handle both dressing and weaving in medium sized mill. First-class references. 42 years of age. 3293, Textile World Record, Boston, Mass.

Overseer of Woolen Weaving. American, 40 years of age, married, with experience on worsteds, cassimeres, kerseys, dress goods, satinets, etc., wants a position in the East. Has worked on all machinery used in this work. 3412, Textile World Record, Boston.

WOOLEN WEAVERS.

Overseer of Woolen Weaving. American, 37 years of age, with experience on fancy cassimeres, cheviots, worsteds, piece dyes and dress goods. Has excellent recommendations. Wishes position in New England. 3401, Textile World Record, Boston.

Overseer of Woolen Weaving. American, 37 years of age, accustomed to fancy worsteds and woolens, dress goods, etc. Held last position 6 years. Prefers the East. 3397, Textile World Record, Boston.

Overseer of Woolen Weaving, 46 years of age, with experience on fine and coarse cassimeres, meltons, worsteds, beavers, blankets, flannels, etc. Would prefer position in Middle States. 3386, Textile World Record, Boston.

Overseer of Woolen Weaving, 44 years of age, with experience on woolen and worsted cassimeres, dress goods, overcoatings, etc., and on Knowles and Crompton looms. Would like a position in the Middle West. 3385, Textile World Record, Boston.

Overseer of Woolen Weaving. American, 36 years of age, has had experience as overseer and on about all classes of woolen goods; Knowles and Crompton looms. Will go anywhere for good position. 3395, Textile World Record, Boston.

WOOLEN SPINNERS.

Boss Woolen Spinner. Would take a good secondhand job. Used to Davis & Furber and Johnson & Bassett machines. Worked on all kinds of goods. First-class references. 3215, Textile World Record, Boston.

Woolen Boss Spinner, or would accept a good second-hand position. Familiar with all kinds of American spinning machinery; Davis & Furber, Johnson & Bassett, English mules, Curtis and Platt. First-class references; age 48, English. Could take a position at once. 589, Textile World Record.

Boss Spinner in a woolen mill.. 32 years of age, American, familiar with Davis & Furber, Johnson & Bassett and English mules and twisters. First-class references. No. 3275, Textile World Record, Boston.

Second Hand in Spinning Room or fixer. Worked on all kinds of woolen and cotton mixed yarns. Familiar with Davis & Furber and Johnson & Bassett mules. 30 years of age, married, American. No. 3282, Textile World Record, Boston.

Boss Spinner or Twister in woolen mill. Familiar with all kinds of woolen, shoddy and mixed goods. Davis & Furber, Johnson & Bassett and English mules. First class references. 32 years of age, American, 3281, Textile World Record, Boston, Mass.

Boss Spinner in woolen mill. Worked on all kinds of woolen, cotton and shoddy mixed goods. Familiar with Johnson & Bassett. Would prefer Furbush mules. First class recommendations. Age 29, American. 3287, Textile World Record.

Overseer of Spinning. American, with experience on nearly all classes of woolen and worsted goods, and on all machinery used in his work, wants position in the East. Best of references furnished. Wants first-class position. 3384, Textile World Record, Boston.

Overseer of Woolen Spinning, or would accept a good second hand position. American, 25 years of age; accustomed to wool and cotton mixes, wool and shoddy, wool pure cotton goods. Worked on the different kinds of machinery used in this work. 3410, Textile World Record, Boston.

Overseer of Woolen Spinning, 33 years of age, married, with 6 years' experience as overseer; worked on all kinds of yarns from 3/4 run to 10 run, and on nearly all the machinery used in spinning room. Prefers a position in New England. 3413, Textile World Record, Boston.

Business Manager, superintendent or agent. Understands the manufacture of sweaters and hosiery. Familiar with all kinds of machinery, and would like to meet a party with capital to invest in knitting business, to manufacture a specialty; little or no competition and good prospects. 31 years of age, American. First-class references. 3260, Textile World Record, Boston, Mass.

FINISHERS.

Overseer of Finishing Room. Cut and full fashioned balbriggan ribbed goods. Familiar with Union Special, Wheeler & Wilson, Willcox & Gibbs, Merrow, etc. Excellent references. Address 2168, Textile World Record, Boston.

Boss Finisher of underwear, cotton or wool mixed goods, who understands Wheeler & Wilson buttonhole machines, Union Button, Union Special, etc., is open to a position in the New England or Middle States. 30 years; American; married. Been employed for a number of years by concern for whom he is now working. Exceptionally good references. 1958, Textile World Record.

Boss Finisher. American. Cheviots, cassimeres, beavers, dress goods, etc. Wants $2.50 to $3 per day. 3123, Textile World Record.

Woolen Boss Finisher. Worked on thibets, cotton and wool warps, satinets, unions, cheviots, kerseys, meltons and cassimeres. Aged 40. Will not go West or to Canada. American. First-class references. 3077, Textile World Record.

Boss Finisher, or would take a second-hand position or wet finishing. Familiar with all kinds woolen and worsted goods, both steam and dry finishing. Age 45, English, first-class references. 2061, Textile World Record.

Overseer of Finishing. Position wanted by man in the prime of life, energetic and a hustler, with 20 years of experience as overseer on all classes of goods from loom to case, in first-class mills. Age 46; married; steady, temperate and reliable. 3333, Textile World Record, Boston, Mass.

Overseer of Wet Finishing. Worked on all kinds of woolen goods, both high and low stock. Would accept a position at short notice. 47 years of age; married; first-class references. 3322, Textile World Record, Boston, Mass.

Overseer of Finishing. Age 30, American, unmarried, with 6 years' experience as overseer, wants position in New England. Had experience on satinets, unions, and all goods where cotton warp is used, also on nearly all machinery used in making these goods. 3335, Textile World Record, Boston.

Overseer of Finishing. 37 years of age, with experience in some of the best mills in New England. Worked on all kinds of woolen and worsted face finished goods and on about all kinds of machinery used in finishing room. Prefers the East. 3344, Textile World Record, Boston.

Overseer of Finishing. Familiar with all kinds of woolen and worsted goods. Will not go West, South or Canada. First-class references; 33 years of age; Swedish. 3295, Textile World Record, Boston, Mass.

Overseer of Woolen Finishing or assistant superintendent, American, 45 years of age, with knowledge of designing; understands figuring yarns and lay outs; worked on beavers, kersey, woolen and worsted suitings, dress goods, coverts, cassimeres, cheviots, etc., and on all kinds of machinery used in his business. 3415, Textile World Record, Boston.

Overseer of Woolen Finishing and Dyeing. American, 26 years of age; accustomed to plain and fancies, dress goods, thibets, cotton warps, worsted mixes, etc., from loom to case. Also all machinery used in this work. Prefers a position in the East. 3387, Textile World Record, Boston.

Overseer of Woolen Finishing. American, 37 years of age, with experience on fancy cassimeres, coverts, friezes, thibet, kerseys, dress goods, etc., and on all makes of finishing machinery. 3407, Textile World Record, Boston.

Overseer of Finishing, first-class man, with experience and best of recommendations, is seeking position in the East. Is accustomed to all kinds and classes of woolen goods and the machinery used in this work. 3396, Textile World Record, Boston.

Overseer of Woolen Finishing, 33 years of age, married, with experience on beaver, kersey, cassimere, covert, thibet, worsted, dress goods, government goods, etc. Understands Curtis & Marble, Park & Woolson machines. 3402, Textile World Record, Boston.

Overseer of Finishing. American, first class in every respect, with good references, wants position. Is accustomed to all classes woolen and worsted goods and all kinds of machinery used in his work. 3383, Textile World Record, Boston.

DYERS.

Dyer. Worked on piece dyes, wool, cotton, shoddy yarns, rags and union dyes and carbonizing. Wants place at once. Good experience and references. 3092, Textile World Record.

Dyer on all grades of worsteds, kerseys, broadcloths, knit goods of all descriptions, alpacas, mohair lining, ladies' dress goods, worsted yarn, cotton yarn, wool and cotton raw stock. Age 41; English-American. 3214, Textile World Record, Boston

Overseer of Dyeing on all classes of worsted, woolen and union goods. Can take position on two weeks' notice. Age 26; American; single. First-class references. 3224, Textile World Record, Boston.

Secondhand in dyehouse. Would accept a position as salesman. Worked in first-class worsted and woolen mills. Age 26; American; unmarried. Can take place on short notice. 3211, Textile World Record, Boston.

Boss Dyer in a woolen mill. Has been for the past ten years with one of the largest woolen mills in the Middle States; has first-class references; 47 years of age, American. No. 3286, Textile World Record, Boston.

Foreman for Aniline Black Department, all silks, cotton, black and taffeta umbrella goods. Age 32; English; married; first class references. 3238 Textile World Record.

Dyer. Age 33; Scotch; unmarried. Worked on every kind of woolen cloth, serges, meltons, shoddy worsted and woolen yarn, etc. Wants $5.50 per day. Will not go South. 3064, Textile World Record.

Boss Dyer. A young man; unmarried. Worked on knit goods, raw stock, dyeing wool and cotton. Refers to past employers. 3069, Textile World Record.

Boss Dyer. Familiar with all kinds of ingrains and rugs, cotton and woolen warps; 19 years' experience in this country; first-class references; 47 years of age; English. 3325, Textile World Record, Boston, Mass.

Boss Dyer. Worked on cotton and wool and mixed stock, yarns and piece goods, hosiery, slubbing and raw stock; also scouring of wool; first-class recommendations; 28 years of age; single; English. 3327, Textile World Record, Boston, Mass.

Boss Dyer and Finisher. Familiar with silk, cotton, wool, underwear; also shirtings, scouring, fulling and bleaching. First-class recommendations. 928, Textile World Record, Boston, Mass.

Boss Dyer or Chemist. Worked on all kinds of cotton goods, yarns and piece, corduroy, plushes and velveteens. Familiar with all kinds of machines for bleaching, dyeing or printing. Capable of taking charge of bleaching, dyeing and printing. First-class references; German-American; 40 years of age. 3311, Textile World Record, Boston, Mass.

Boss Dyer. Worked on low grade wool stock, piece dyes, cap cloths, kerseys and tricots and unions. First-class references. Will go anywhere for a good position. Would make a good man for a mill on unions. 26 years of age; American. 3256, Textile World Record, Boston, Mass.

Overseer of Wool and piece dyeing. 14 years' experience as overseer. Accustomed to all wool pieces, unions, cotton and shoddy, beavers, cheviots, also sulphur colors, etc. Steady, sober and industrious, with good references. Wants position in the East. 3366, Textile World Record, Boston.

Overseer of Dyeing. American, 36 years of age, with experience on all kinds of worsted and woolen goods, cotton mixes, indigoes and raw stock, is seeking first class position in a good sized mill. Best of references. 3233, Textile World Record, Boston.

Overseer of Dyeing. American, 24 years of age, with experience on loose wool, slubbing, woolen and worsted yarn, piece dyes and silk. Would accept a good second hand position. Prefers New England. 3378, Textile World Record, Boston.

Overseer of Woolen Dyeing. American with experience on high and low grades in woolen and worsted, raw stock in wool and shoddy, piece dyes, etc.; 12 years' experience as overseer, with best of recommendations. 3404, Textile World Record, Boston.

KNITTERS.

Superintendent of Hosiery Mill. American, 40 years of age, with a number of years' experience as overseer, would accept a good position anywhere in United States. Worked on cotton and lisle hosiery, fashioned, seamless, lace, embroidered and plain, and on nearly all makes seamless machines and all others used in an up-to-date mill. 3352, Textile World Record, Boston.

Superintendent of Knitting Mill. American, 28 years of age, with experience on flat wool and cotton, all wool sweaters, rib goods of wool, worsted cotton and cotton plaited. Understands nearly all kinds of machinery used in making these goods. 3348, Textile World Record, Boston.

Overseer of Knitting. American, 31 years of age, with 10 years' experience in knitting room as second hand and overseer. Worked on men's gauze underwear, and on plain woolen and plush work. Wants position in the East. 3350, Textile World Record, Boston.

Superintendent or boss knitter. Worked on men's fine balbriggan, ladies', men's and children's wool underwear. Familiar with all kinds of knitting machinery. 27 years of age, American. 3259, Textile World Record, Boston, Mass.

Superintendent of a knitting mill. Worked on cotton, wool, merino and silk, plain and ribbed hosiery and underwear. Will not go South or West. First-class references. American, 42 years old, married. 1722, Textile World Record, Boston.

Boss Knitter or Finisher. German-American; single; age 22. Worked on tokes, skirts, globe mittens. Some experience with hosiery. 3240, Textile World Record.

Boss Knitter or superintendent of a hosiery mill. Worked on worsteds and cotton, infants' and misses' and ladies' and men's half hose. First-class references; 37 years of age; American. 3268, Textile World Record, Boston, Mass.

Boss Knitter. Worked on sweaters, toques, both woolen and worsted, cylinder and flat machines. Could take position in one week's notice. First-class recommendations; 33 years of age; married. 3278, Textile World Record, Boston, Mass.

Boss Knitter or Superintendent of knit underwear. Worked on all kinds of ribbed underwear and all makes of machinery. First-class recommendations. 3306, Textile World Record, Boston, Mass.

Foreman of Cutting Department in a knitting mill, or an assistant. Worked on all kinds of knit goods, with four knife or by hand, with knife or shears on fine work. Will guarantee 100 dozen per day. Will not go South or Canada. 24 years of age; American. 3320, Textile World Record, Boston, Mass.

Boss Knitter or second-hand in an underwear mill. Familiar with silk, worsted, cotton and mixed yarn of all kinds. Will not go West, South or to Canada. 32 years of age, American, married. 1819, Textile World Record, Boston, Mass.

Superintendent of Ribbed Underwear Mill. Finisher or salesman. Familiar with all kinds of ribbed goods. All kinds of ribbed machinery. Would prefer a position in the South. Age 38, married. American. 2036, Textile World Record.
American. 889, Textile World Record.

Foreman of Finishing in knitting mill. Familiar with plain and ribbed goods for ladies and gentlemen. Familiar with all kinds of sewing machines used in underwear finishing. 38 years of age, married. Could take a position in ten days' notice. 3253, Textile World Record.

A young man, of several years' experience, as foreman knitter on single and double thread flat goods, plushes and fleeces, wants a position of any kind where he will have a chance to learn latch needle knitting. No reasonable offer refused. 3038, Textile World Record.

General Manager or superintendent of ribbed underwear mill. American; married. Been in underwear business eleven years as superintendent and manager. First-class references as to character and ability. 3100, Textile World Record.

Boss Knitter and machinist. Worked on hosiery, mittens, underwear, fancy shirt bands and shawls. Familiar with all kinds of knitting machinery. German, 39 years old, married. 1059, Textile World Record, Boston.

DESIGNERS.

Designer, woolen and cotton novelties. Used to fancy cassimere, ladies' dress goods, suitings and men's wear worsted, cotton and wool mixes. First-class references. Age 24; Scotch; single. 3212, Textile World Record, Boston.

Designer or boss weaver. Age 35; American; married. Worked on all kinds of worsteds, cheviots, men's wear, dress goods and coat linings. Used to Knowles and Crompton looms. First-class references. Can take position one week's notice. 3210 Textile World Record, Boston.

Designer or Assistant Superintendent. 40 years of age, married, with experience in best mills in New England. Worked on all kinds of dress goods, from the finest to the heaviest. Understands web drawing and twisting, hand dressing and short chain beaming. 3363, Textile World Record, Boston.

Jacquard and Crompton Loom Designer. 30 years of age, with experience. Worked on fancy cotton, Indian shawls, ladies' shawls, cassimeres, etc. An original designer and will send samples of work when desired. Would accept a good position anywhere in the States. 3364, Textile World Record, Boston.

Designer. Familiar with worsteds and woolens of all kinds. Could take a position at short notice. 28 years of age; German. 3264, Textile World Record, Boston, Mass.

Designer or Assistant Superintendent. Worked on woolen and worsted of all kinds and mixed goods. 21 years of age; first-class recommendations. 3296, Textile World Record, Boston, Mass.

Designer. Worked on ladies' dress goods, shirtings and flannels and some jacquard designing; first-class recommendations; 33 years of age; married. 3285, Textile World Record, Boston, Mass.

Designer. Familiar with suspender, elastic and non-elastic; also tapes and dress goods. 29 years of age; first-class references. 3186, Textile World Record, Boston, Mass.

Designer or superintendent. Age 37; English; married. Experienced in this country and England. Worked on cloakings, suitings, coverts, broadcloths, etc. Wants $30 to $40 per week. Mill closed, and wants place at once. Good references. 3140, Textile World Record.

Designer or assistant. Worked on all classes of woolen and worsted goods, worsted mercerized men's wear and dress goods. Familiar with all kinds of woolen machinery. First-class references. Age 26. 3127, Textile World Record.

Designer. Understands all kinds of worsted and woolen goods for men's or women's wear. Could take a position at once. Age 28 years. First-class references. 3264, Textile World Record.

Superintendent of underwear or boss knitter. Worked on all kinds of underwear from fine to coarse. Worked on all kinds of knitting machinery. Would prefer a position in the West. 51 years of age, English, married. Address 3176, Textile World Record, Boston.

Manager or assistant, or executive position in an underwear mill. Worked on fine wool and cotton knit underwear from raw material to finished product. Some knowledge of hosiery. Will not go West or South. 54 years of age, American, married. 3109, Textile World Record, Boston.

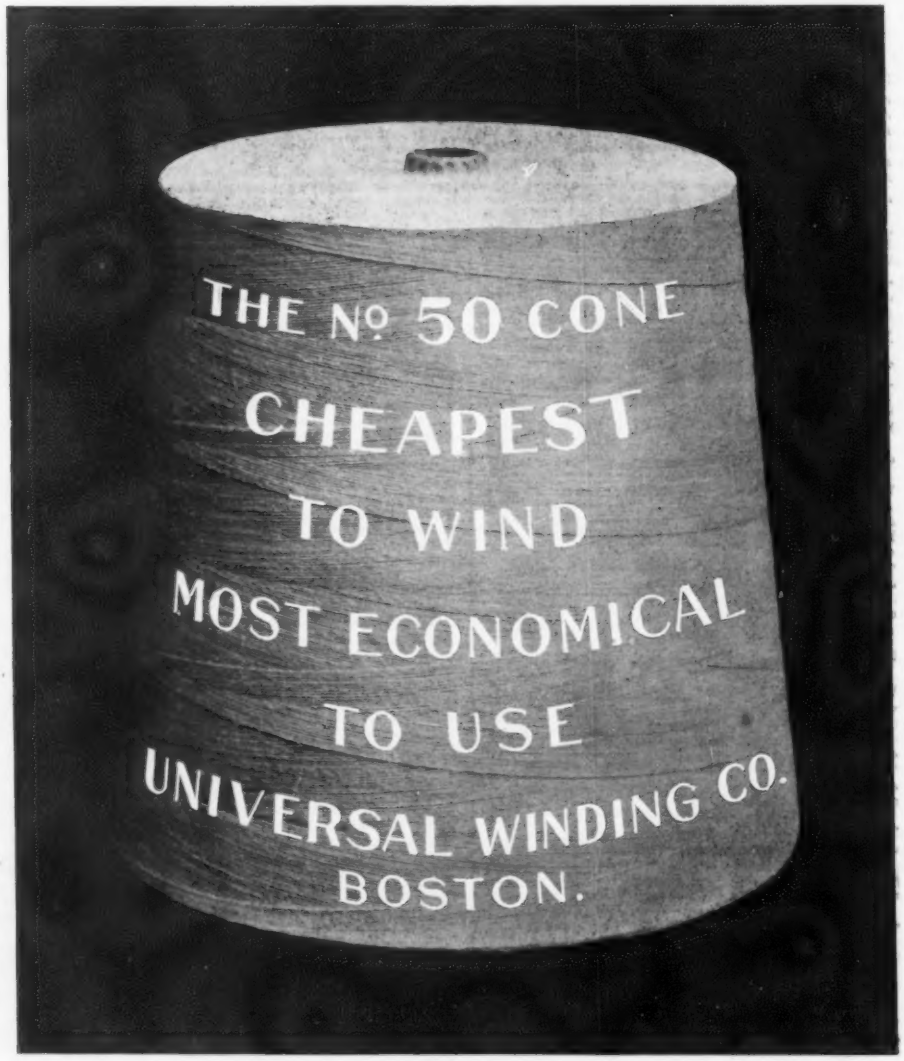
Boss Knitter in underwear mill. Worked on all gauges as fine as 28, wool, cotton and silk. Latch and spring needle machines. 39 years of age, American, married. 1669, Textile World Record, Boston, Mass.

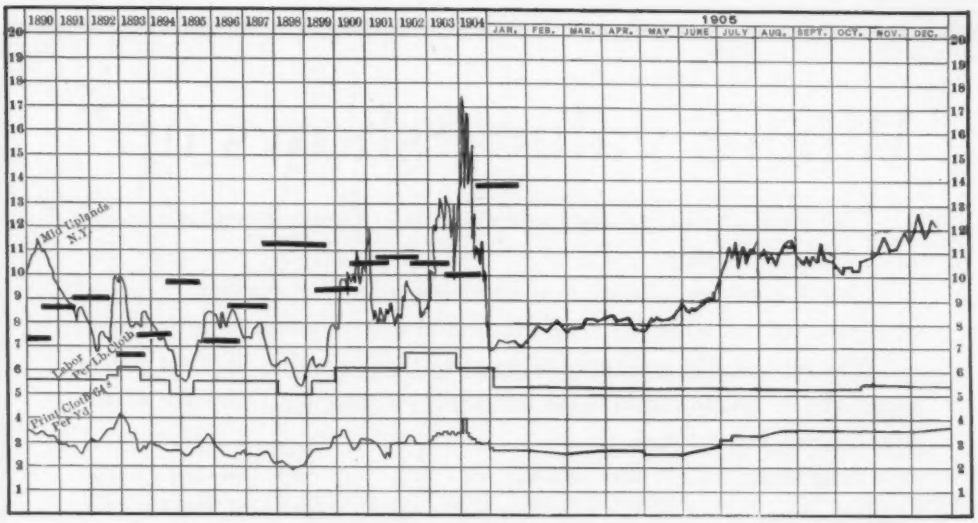
Superintendent or boss knitter. Worked on latch needle goods, light and heavy weight underwear only. 38 years of age, American, married. 1812, Textile World Record, Boston, Mass.

Designer or assistant superintendent. Worked on cotton warp flannel coverts, plain and fancy cotton warp, and all wool dress goods. First-class references. 3244, Textile World Record.

Assistant Designer or assistant superintendent. Young man; American. Men's wear, ladies' dress goods, shirtings, silk brocades, etc. Graduate of Philadelphia Textile School, and also has had short experience in mill. 3160, Textile World Record.

Designer on any class of dress goods, waistings, mantle cloths, fine shirtings, etc. 3203 Textile World Record.


THE No. 50 CONE
CHEAPEST
TO WIND
MOST ECONOMICAL
TO USE
UNIVERSAL WINDING CO.
BOSTON.


1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904
1905
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
Mid Uplands N.Y.
Labor Per Lb. Cloth
Print Cloth 64 Per Yd.

The short, heavy, horizontal lines indicate the size of the cotton crops in millions of bales.

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

Cotton Market.

The cotton market has been well in the control of the speculators during the last month and the various cotton reports issued by the government and by private individuals have exerted a demoralizing influence. Prices have hovered around the 12-cent line with a strong undertone prevailing throughout.

The reports issued by the International Federation of Master Cotton Spinners' and Manufacturers' Associations show that the stocks held by European mills are smaller than many had expected. These, in connection with the fact that at best the present crop will be of but moderate proportions, are the factors that operate against a decline. The consumption of cotton is unprecedented. Cotton mills of all kinds in all parts of the world are well supplied with orders, but the recent advance has checked purchases in all parts of the world.

The spinners of Lancashire are talking of short time next year, but this talk is the result of the strong statistical position of cotton at the present time. Doubtless the present rate of consumption will bring the European mills face to face with a condition that will force them to curtail consumption. There is also the market manipulator to be considered, who particularly flourishes under conditions like the present.

The movement into sight from September 1 to December 22 is reported by the Chronicle for a series of years as follows:

Dec. 28, 1900, 6,458,494 bales.
Dec. 27, 1901, 6,338,349 bales.
Dec. 26, 1902, 6,410,325 bales.
Dec. 25, 1903, 6,559,898 bales.
Dec. 22, 1904, 7,471,709 bales.
Dec. 22, 1905, 6,532,198 bales.

The world's visible supply, estimated by the same authority, is given as 5,112,236 bales on December 22, as compared with 4,611,550 bales in 1904, 3,968,533 bales in 1903 and 3,756,315 bales in 1902.

*North Carolina, Charlotte. The Calvine Manufacturing Company has been organized to continue the Orient Mfg. Co.'s plant, recently sold at auction.

*New York, New York. The International Trust Company, which bought in for the bondholders of the Southern Textile Company, the Windsor, Chicora and Moorhead Cotton Mills, has sold the mills to Philadelphia and New England parties for $170,000. A new deed of trust securing $175,000 of 6 per cent. bonds will be created with the International Trust Co. All of the bonds have been placed.

WEIMAR BROS. MANUFACTURERS OF Cotton Mercerized Tapes,

SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.

Phone Connections. Works, 2046-48 Amber Street. PHILADELPHIA, PA.

Where value "shows up"

The unusual wearing and lasting qualities of antique rugs is a matter of common knowledge.

These wools are scoured in the running water of a stream charged with native alkali which of necessity is mild and harmless in its action.

The remarkable properties of these wools is not due to their native superiority as much as it is to the harmless yet effective character of the washing process.

That soda ash (pure alkali) caustics, in fact, all the harsh alkalies commonly used for scouring purposes do injure and weaken the raw wool and cloth cannot be doubted. The very nature of these alkalies is of such a destructive character that the delicate wool fibre offer but little resistance to their work.

Wyandotte Textile Soda

furnishes the mill man a scouring compound more nearly that of the ideal than any other known article. Effective yet not destructive, it leaves the wool a snow white color, soft and lofty in its texture, and with none of its natural properties in the least impaired. This is where the value of the scouring properties of Wyandotte Textile Soda "shows up." Try it, what you see you know. Order from your supply house.

None Genuine except with a card bearing this Trade Mark

In Every Package.

The J. B. Ford Co.,

SOLE MANUFACTURERS,

Wyandotte, Mich.

THIS SODA WAS AWARDED THE HIGHEST PRIZE — GOLD MEDAL — AT BOTH THE ST. LOUIS AND PORTLAND EXPOSITIONS.

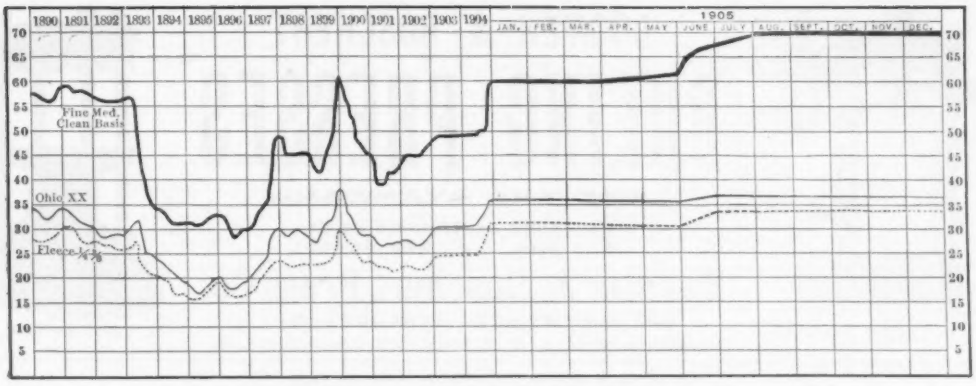


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

Wool Market.

The wool market has been dull and featureless, with prices well maintained. This condition has resulted partly from the holiday season and the closing of accounts incident to the end of the year. The large mills, however, have been ready at all times to pick up desirable lots that have been offered.

The call is still for worsted wools, but there are indications of a revival of the demand for woolen goods. This would quickly cause a boom in the clothing wool market as the mills are short of this class of wool. The consumption of wool at present is very large and in view of the prosperous conditions of the country no good reason can be brought forward for a belief in any material decline in wool values.

An encouraging feature is the satisfactory condition of the cloth market. Advances have been easily secured and the woolens so far opened up show that the consumer is able to pay an increased price that will compensate the manufacturer for the increased cost of the raw material.

The foreign market has been strong in all grades. Advances have prevented American buyers from buying as freely as they otherwise would. In domestic pulled wool there has been some indication of weakening, which has been particularly marked in the ordinary B grade. The wool dealers are watching with interest the developments in the goods market, as it is realized that a change of fashion to woolen goods would be likely to remove the present large demand for worsted wools and thus equalize conditions.

*North Carolina, Littleton. The Littleton Hosiery Mills have completed their new dye house and duly installed the equipment. They have also expended about $1,000 on other mill machinery.

You Save Enough Insurance to Pay for the Equipment.

So it costs you NOTHING to have the AMERICAN WATCHMAN'S CLOCK. Fully approved by all insurance companies. We equip factories with Fire Alarms, Signals, etc., also Employee's Time Recorders, and Telephone Systems. Electric Time System consists of Master Regulator in office with secondary electric clocks throughout the mill, insuring accurate time. Send for particulars.

Pettes & Randall Co., 150 Nassau St., New York

STANDARD QUALITY COMBED RAMIE TOPS and NOILS a Specialty. **RAMIE YARNS in All Numbers for All Purposes.**

Wool, Mohair, Camel Hair, Silk, and Ramie Tops and Noils.

FRANK A. TIERNEY,
Wool, Tops, Noils, Yarns.

Woolen, Worsted, Mohair, Ramie and Silk Knitting Yarns.

All Kinds of Yarn for Weaving Purposes. Special Fibres and Novelties for Woolen, Cotton and Silk Manufacturers.

Room 203, Wool Exchange Building, 260 West Broadway, New York.

Wool and Woolen Goods Made **NONSHRINKABLE** by the use of "Nevershrink Process."

May be applied at any stage of manufacturing. Write for Booklet.

CHARLES H. HEYER,

1501 Real Estate Trust Bldg. **Philadelphia, Pa.**

FOR WOOL Nevershrink PROCESS. Registered.

KNUCKLE JOINT.

BOOMER & BOSCHERT

BALING PRESSES

ARE THE STANDARD

Hydraulic or Knuckle Joint
Any Size .. Any Power

Boomer & Boschert Press Co.

338 West Water S., SYRACUSE, N. Y.

Southern Agent, A. H. WASHBURN, Charlotte, N. C.

HYDRAULIC.

The only All Steel Ring Traveler ever made.

DE HAVEN ALL-STEEL RING TRAVELERS

The reign of the Ring Traveler Octopus is over.
Independence and Progressive Methods have clipped his claws.

The DE HAVEN ALL-STEEL TRAVELERS save Cotton, Time and Money. Use them and pay dividends.

MANUFACTURED ONLY BY DE HAVEN MANUFACTURING COMPANY, [illegible]

The Success of the Mill Depends on its Travelers.

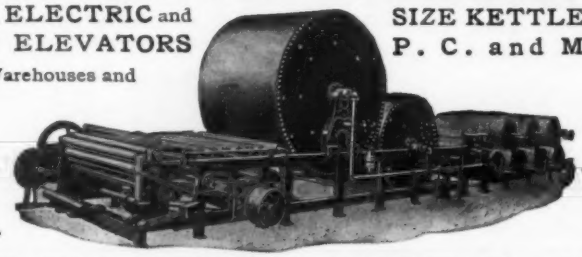
The COHOES SLASHER.

BELT-DRIVEN, ELECTRIC and HAND-POWER ELEVATORS

For Cotton Mills, Warehouses and Factories.

PULLEY BLOCKS.

OVERHEAD TRACKS.



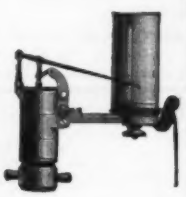
SIZE KETTLES. REPAIRS for P. C. and M. MULES and EMPIRE LOOMS.

WATERWHEEL GOVERNORS.

The COHOES IRON FOUNDRY & MACHINE CO., Cohoes. N. Y.

A Crosby Indicator

In the Hands of a Competent Man Will Increase the Effeciency of Your Plant and Cut Down Your Coal Bill. Faultless in Design. Perfect in Workmanship.



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TRADE MARK CROSBY

Pop Safety Valves
Pressure and Vacuum Gages
Water Relief Valves
Blow-off Valves
Rubber Pump Valves

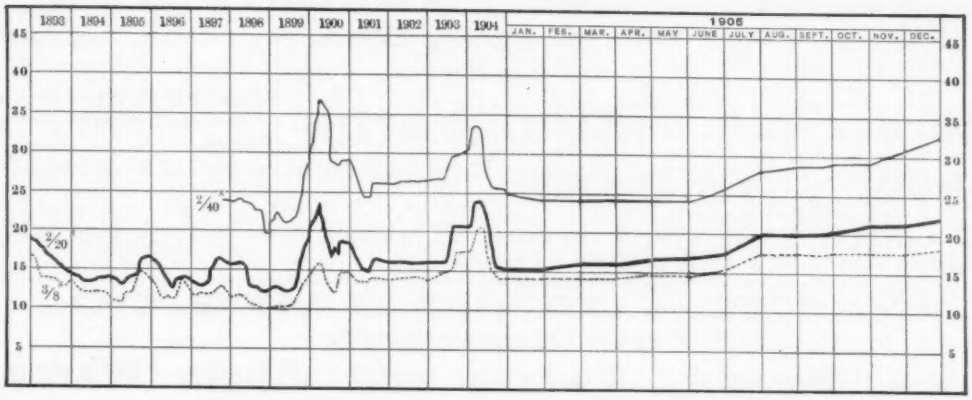
Recording Gages
Single Bell Chime Whistles
Feed Water Regulators
Lubricators—Oil Cups
Gage Glass, Water Gages, Etc.

CROSBY STEAM GAGE AND VALVE CO.

Stores:
BOSTON, NEW YORK, CHICAGO, LONDON

Office and Works:
BOSTON, MASS.

Yarn Department.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Cotton Yarn Market.

It is a consumers' market on nearly all grades. The stocks are small and the requirements of both knitters and weavers are large; the strength of raw cotton supplies an additional reason for maintaining prices at the highest market point of the year. It is distinctly difficult for buyers in need of spot goods to find what they require, while future business is well covered for months to come.

To a certain extent the price for raw material has been eliminated as a ruling factor in the cotton market, the forces in control being the needs of the weavers and knitters and the spinning capacity of the yarn mills. Our prices are to some extent nominal; there have been many cases where needy buyers have been compelled to pay fancy prices for immediate deliveries:

Eastern Cops.

6's	19
8's	19½
10's	20
14's	21
16's	21½
18's	22
20's	22½
22's	23
24's	23½
26's	24
30's	25½
34's	27
36's	28
40's	29

On cones, ¼c. more up to 14's; 1c. more from 15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12's	23
14's	24
18's	24½
20's	25
24's	26
26's	28
30's	30
36's	32
40's	35
45's	37-38
50's	39-42
55's	43-45
60's	46-48

Eastern Two-Ply Warps, Carded Peeler.

2/30's	30
2/36's	32
2/40's	35
2/45's	38
2/50's	44
2/60's	47

Egyptian Weaving Yarns.
Single Skeins Combed.

30's	36
36's	38
40's	40
45's	43
50's	48
55's	52
60's	55
70's	58

Philadelphia Yarn Market.

Business on yarns of all kinds has continued good; prices have been well maintained, and are still holding very close to the top prices of the year. Most manufacturers are busy on old orders, but new orders, based on present high prices of yarns, are not very plentiful. Jobbers are buying as sparingly as possible on today's market, and it will require a little time for business to become adjusted to the higher level. Demand for weaving yarn is better than for knitting yarn.

Spinners are well supplied with orders for prompt delivery and are in position to be independent about prices. The cotton market is in such condition that speculators are offered a good opportunity to manipulate prices, and probably before

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

WALCOTT & CAMPBELL SPINNING COMPANY

Fancy Hosiery Yarns

IN ALL COLORS

New York Mills, Oneida Co., New York.

Wiscasset Mills Co. | Patterson Manfg. Co.
Efrid Manfg. Co. | Tuscorora Cotton Mill.

HIGH GRADE HOSIERY YARN

White and Colors. All Numbers.

Sewing Twines on Cones and Tubes.

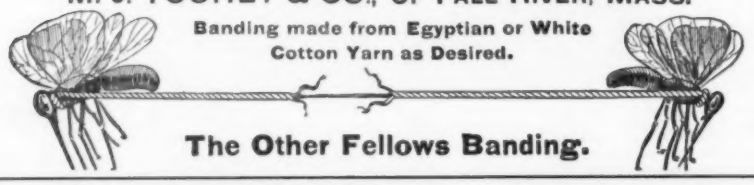
SPECIALTIES IN WEAVING YARN.

Black and white. Double and twist for woolen trade.

CANNON MILLS, 55 Leonard St New York.

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.



The Other Fellows Banding.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

4s to 60s.

HOUSATONIC, MASS.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

the new crop comes along an attempt will be made by the strong bull element to corner or at least to advance the market.

Prices today are about as follows:

Southern frame spun cones:—

7's and Coarser	20
8's and 9's	20½
10's	21
12's	21½
14's	22
16's	22½
18's	23
20's	23½
22's	24
24's	24½
26's	25
30's	27
40's	32
50's	37

Southern high grade mule yarn:—

Cones.

10's	22
12's	22½
14's	23
16's	23½
18's	24
20's and 22's	24½-25
24's	25½

Southern frame yarn, lower grades:—

6's and 8's	19½
10's	20½

Eastern cones (high grade quality):—

10's	22½
12's	23
14's	23½
16's	24¼
18's	24¾
20's and 22's	25¼-25¾

Skein yarn (mostly Southern):—

4's and 8's soft	19½
10's to 12's	20-20½
14's to 20's	21-22½
22's	23
14/2	22
16/2	23
20/2	24½
30/2	28
40/2	34
16/3 slack	22
12/3 slack	21
8/3 carpet	19½
8/3 slack	19½
9/4 slack	19½

Warps (Southern):—

10's to 12's	20½-21
14's	22
16's	22½
20's to 22's	23-23½
26's	24½
14/2	23
16/2	24
20/2	25
24/2	26
30/2	28
40/2	34

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Polished Threads and Tinsel. Artificial or Wood Silk.
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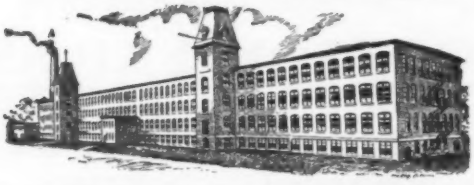

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Capacity, 45,000 Spindles.

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YARNS 40's and above. AND
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Cotton Warps and Yarns. In Gray and all Colors. Single or two or more Ply, and Cable Cord.
Novelty Yarns. in Various Patterns, Colors and Twists.
Carded and Colored Cotton. For Mixing with wool; Machined or in Roving.
Indian Orchard, Mass.
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Mixed colored yarns (mock twist, half colors):—
6's to 10's 21-22
12's to 14's 22½-23
16's to 18's 23½-24
Mock Egyptian, 2c. advance over white.
Egyptian, 4c. to 5c. above best quality white.

Worsted Yarn.

Spinners have many orders booked for future delivery and their success depends on the outcome of the heavy weight season. If the heavy weight season develops a strong demand for worsted cloth, as many believe it will, all will be satisfactory and the spinners will have a run that will last until June. While all spinners are well filled with orders for the future—for immediate delivery and up to February 1st—they would much like to secure orders. Concessions have even been made, but no orders have been secured. Spinners are trying to induce customers to take some of the yarn ordered and many are the "kicks" in consequence.

The demand is running largely for 3/8 blood to 1/2 blood yarn. Much Australian cross bred wool is being used to make this yarn, to the great satisfaction of the weavers. The finish of goods made from this yarn is much superior to that of goods made from domestic wool of the same grade, and when once this yarn made from Australian cross bred is used in samples, yarn made from domestic wool cannot be substituted. We know of weavers that are giving preference to spinners for this very reason. The samples were made from these cross bred wools and cloth made from other yarn caused buyers of the cloth to return it to the manufacturer. This is a question for the domestic wool grower to consider: how to keep prices of this class of wool low enough to prevent the use of cross bred Australian wool by the spinner.

At present, so far as the heavy weight season is concerned, everything is in the air. Even though weavers see a lower tendency for yarn for immediate delivery and realize that December is the best month in the year to buy more yarn, yet they will not buy further as they are not sure of their ground.

The coming heavy weight season is going to be a hard one for the weavers. All the old lines which were popular last year have got to be materially advanced, and the question is how much of an advance will the buyers stand. Will the buyers take the old popular lines at an advance, which will mean that the clothier will have to advance all his clothing lines $1.00 per suit for each suit of clothes, or will they substitute cheaper cloth and keep their

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Flax, Hemp and Jute Line and Tow Yarns,
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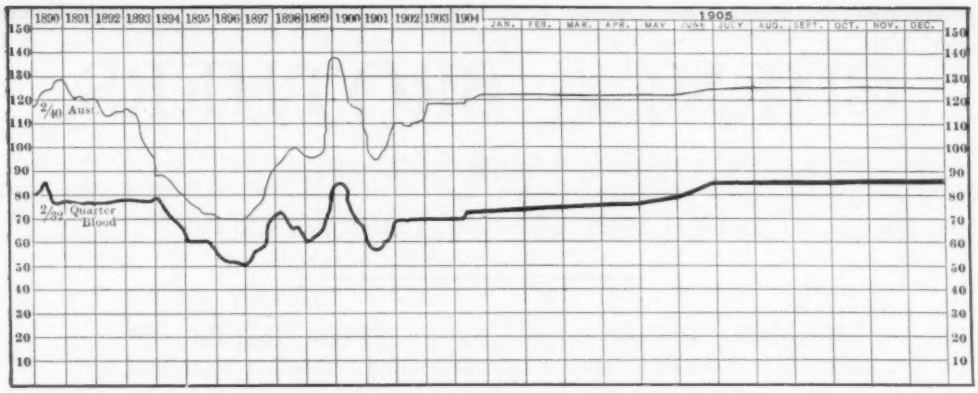

CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

suits at the same price as last year? Will those who have heretofore bought nothing but the very best cloth buy that cloth at a heavy advance or will they substitute a cheaper cloth for the same price paid last season for the better grades? And in that event what will become of the weaver that has made nothing but the better grades? These are the problems that confront the weavers and buyers of worsted yarn. They must cover themselves as far as they dare on yarn, and trust to luck, with the certainty that if the goods they have bought the yarn to cover do not sell, they are 'stuck," while if they do sell they have got to purchase more yarn at the spinners' price. The weaver is forced to buy more or less yarn in advance of the season anyhow, because he would be unable to quote safely on his cloth if he took a chance on covering for yarn later.

Weavers state that on the present light-weight season they have had a good run, and although during the season they were forced to advance prices it did not interfere with the sale of their cloth in any way. The heavy-weight season on men's wear will open about February. Cotton yarn will be used to displace much worsted yarn and much double and twist cotton yarn will be substituted for worsted double and twist. Everyone knows that the coming season is to be a worsted season—although woolen cloth will be offered, but at no great concessions over worsted.

Some of the large weavers and spinners have advanced the wages of employes 10 per cent. This undoubtedly was a good move, at it has brought contentment to their operatives and if a big heavy-weight season's business is secured they are assured they are assured of a good run without labor trouble in the middle of it. Furthermore one of the concerns advancing wages is building a large factory, which will call for the employment of 3,500 extra operatives. These operatives must be secured from somewhere and an advance is one method of calling attention to this fact. The other weavers will be obliged to follow suit or stand a chance of a demand from operatives later.

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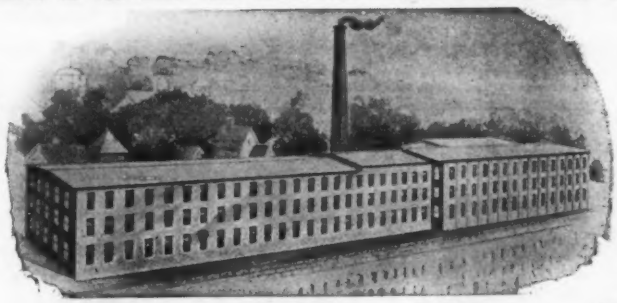
LUSTRE YARNS FOR SERGE LININGS ALPACA YARNS



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DRESS GOODS YARNS KNITTING YARNS WORSTED YARNS

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TRAMS, ORGANZINE AND SPUN SILKS IN THE HANK, OR ON SPOOLS AND CONES.

SILKS FOR ELECTRICAL USES, INSULATION AND SPECIAL PURPOSES MADE TO ORDER.

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Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

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SAUQUOIT SILK MFG. CO.,

INSULATING AND BRAIDING SILKS.

ORGANZINE, TRAM & HOSIERY SILKS.

Fast Dye Organzines for Woolen Manufacturers a Specialty.

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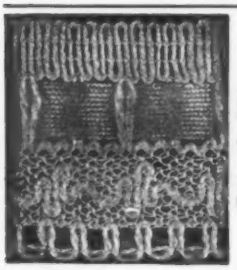

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BRAIDS Cotton, Worsted, Mercerized, Cotton and Silk Twilled. **TAPES** Common, Twilled, Superfine and Plain 12 to 35s, white and colors on spools.

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ANILINE BLACK

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Well known specialists, after thorough researches, found the WILD Black ***IRREPROACHABLE,*** the most brilliant color, the most solid and the cheapest.

I PLEDGE MYSELF, THAT IF THE BLACK IN A PRACTICAL WAY, IS NOT SUPERIOR TO AND CHEAPER THAN ANY KNOWN IN THE WORLD, ALL CONTRACTS I SHALL MAKE WILL BE CONSIDERED NULL AND VOID.

We absolutely do away with previous and subsequent (to the Oxydization) manipulations which are usually needed and produce our black in one operation.

CHAS. E. WILD, Lansdowne, Penna.

The French spinners continue busy and are making much raincloth yarn as filling for men's wear. They have also secured good orders from knitters, but the yarn sold knitters is largely percentage yarn, part cotton and part wool. The dress goods manufacturers continue busy on specialties. The bunting weavers are running slow at this time and are well covered for yarn. The combers continue busy on fine tops; many have been running day and night on this class of work for the last six months. On the coarser grade tops the business is slow.

Prices generally are well maintained for yarn and spinners are looking forward to a good run, and when the season opens it will be difficult to secure prompt deliveries.

We quote:

2/4s Australian	1.28
2/40s Delaine	1.23
2/36s 1/4 to 3/8 Blood	97 1/2-$1.00
2/32s 1/4 Blood	86
2/20s 1/4 Blood	80-85

Woolen Yarn.

Spinners continue to run slowly. The past six months have been very unsatisfactory with the majority of them.

The advance in wool caused manufacturers to reduce the quality of their stock without reducing the size of the yarn to be spun, and the stock was lowered to such an extent that spinners who did the work on a commission basis were unable to get out whole on the work secured; most of them did no more than to make expenses. Many of the buyers that usually have their yarn spun on commission, finding that they could not buy stock and produce yarn cheap enough, made a set price to

WILLIAM B. CHARLES,

Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,

For the Underwear Trade.

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WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
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Main St., foot of Centre St., Manayunk, Philadelphia.

Knitting and Weaving
YARNS.

Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

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NON-FLUID OIL

Neither drips on floor nor spatters on card clothing and drawing cans like fluid oils.
One application lasts four or five times longer than fluid oil and keeps boxes cooler.

Free Sample Sent by Paid Express **Write Today**

NEW YORK & NEW JERSEY LUBRICANT CO.,
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10 to 35% Increased Output

with no added expense for operation, is the proven result of eight years' use of **Warren's Pulley Cover** in Textile Mills. It does this by reducing the slipping of belts to a minimum, while allowing them to run slack. It is not sticky, and catches no dust or lint. It is very durable, wearing for several years under ordinary conditions. It costs but 10c. to 12 1/2c. per square foot, according to size of package.
Smallest package, 40 sq.ft., $5.
Regular Case, 125 sq. ft., $12.

IT IS JUST WHAT YOU NEED. ORDER TODAY.

The Warren Co., Manufacturers,
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Established 1860—Incorporated 1893.

THE S. BLAISDELL, JR., CO.,
COTTON, EGYPTIAN PERUVIAN
American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.
CHICOPEE, MASS.
Cotton Waste Purchased on Yearly Contract from Mills.

C. MOORE & CO.,
Manufacturers of
TWINES, THREADS AND YARNS,
Jacquard Harness Twines of all kind on hand and made to order.
S.W. Cor. Fifth and Market Sts., Phila.

spinners. Spinners have undertaken to meet these prices on the basis given, but have not more than made expenses. Some of the best customers of the spinners shut down on them entirely. For all this some spinners secured other work and have had a fairly good run, while others, especially the sale yarn spinners, state that the past six months have been the worst that they have experienced in many years.

It is believed, however, that the worst of the hard times for woolen spinners have been experienced. After the first of the year it is expected that many orders for wool goods will be secured and in that event there will be a great push to get back old spinners. Manufacturers are working cautiously and are buying stock for yarn carefully. One very large wool house offered to sell a weaver and spinner a large line of clothing wool at a price which surprised him, and offered to let him take his time in paying for it. The weaver said he would not buy until he saw how his cloth sold. Many lines of all wool cloth using woolen spun yarn are on the market and if they sell much woolen spun yarn will be used, and this means that much wool must be purchased which certainly will strengthen the market, as not many of the manufacturers have covered for clothing wool or wool spun yarn. Many of the weavers have lines all laid for hiring

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European and Asiatic Raw Silks. Wild Silks and Douppions a Specialty.

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SPUN SILK, SCHAPPE, TUSSAH } Yarns in Stock.

H. de VEER,
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TUSSAH WASTE,
SILK NOILS,
DOUPPION.

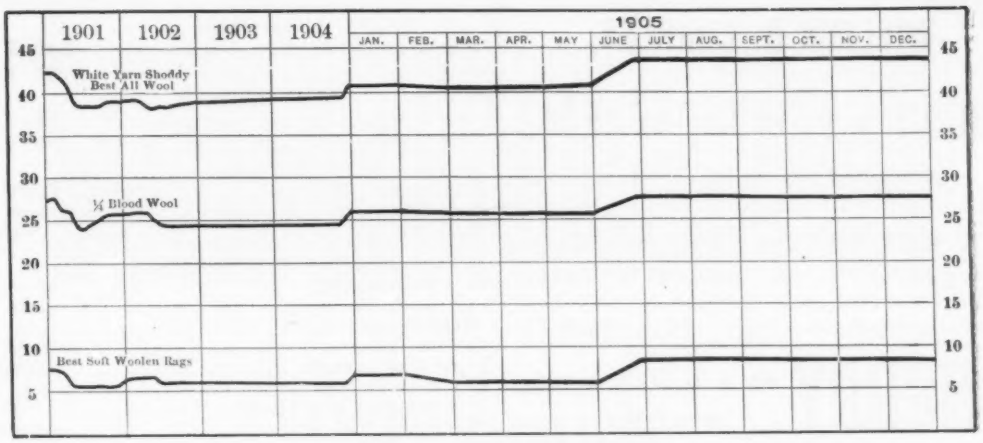

CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

machinery space in case orders requiring woolen spun yarn are secured.

The eiderdown knitters and the French flannel weavers continue to run full. The hosiery knitters are using much merino yarn and are placing orders for future delivery. There is also much yarn to be run for backing and also woolen spun yarn will be more or less substituted for worsted yarn. Some weavers are making worsted cloth out of woolen spun yarn warp and worsted yarn filling. On the whole the outlook for the spinners is good and the coming six months will probably give the spinners all the work they can do. Two-ply woolen spun yarn is in good demand and is selling well. The yarn is sold at a price and spinners are finding it difficult to get stock out of which to make the yarn already sold.

The knitters throughout New York State are busy, but this being the end of the year they are buying but little wool or woolen yarn. After the first of the year some good orders must be placed. Much yarn for the backing of fleece lined underwear must be placed by knitters and at advanced prices. The Australian lamb's wool contracts have not yet been placed. The importers that purchased early in the season have paid full prices; those that waited have secured lower prices and better values. After the first of the year many orders for thread waste will be placed, and also for the other stocks that are being ordered.

Rag and Shoddy Market.

Hope instead of business fills the air in this market, and dealers are looking forward for a materialization of the long-promised demand for cheviots, which will enable manufacturers to use shoddy and extracts as raw material. The business transacted has been small and confined to actual requirements. Rag dealers have not been inclined to make concessions in prices, doubtless realizing that no reduction would induce purchases in present conditions.

The rags have been in moderate supply and mills and shoddy manufacturers have been compelled to pay high prices for such stock as they might require. The better grades of wool waste are scarce and there is practically no demand for the lower grades. Cotton waste is dull, there being very little demand and that confined to the better grades. Prices, however, are well maintained in sympathy with the strong position of raw cotton.

We quote as follows:

SHODDIES AND EXTRACTS.

White yarn, best all wool	44-47
White knit, all wool, best, fine	35-40
White knit, No. 2	30-35
Light yarn, extra fine	30-35
New pure indigo blue	28-30
Merino.	
Fine light, all wool, No. 1	24-27
Medium light, all wool, No. 1	15-17
Medium light, all wool, No. 2	15-17
Fine black, all wool	25-27
Fine dark, all wool, best grade	22-25
Medium dark, all wool, No. 1	18-20
Medium dark, all wool, No. 2	15-16
Red knit stock, strictly all wool	20-22
Red flannel, all wool	20-22
Dark blue for hosiery, strictly all wool, No. 1	20-22
Dark blue for hosiery, not all wool, No. 2	15-18

WOOLEN RAGS.

Fine merchant tailors, all colors	10-11
Choice light colors	13-14
Browns	12-13
Blacks	9-10
Fine blues, plain	9-10
Fine dark	12-13
Medium dark	7-8

WILLIAM B. CHARLES,

Cotton and Cotton Wastes

Amsterdam, N. Y., U. S. A.

COTTON YARNS.

Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

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WM. H. H. SLACK & BRO.,
Springfield, Vt.

Carbonized Stock a Specialty.

FLOCKS

M. B. SCHWAB, Pres. H. RAWITSER, Treas.
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RIVERDALE WOOLEN CO., MANUFACTURERS OF

.. Shoddies ..

Of every description. Capacity 7,000,000 pounds per annum
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MANUAL OF WEAVE CONSTRUCTION,

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Translated and Arranged for American Practice by Samuel S. Dale.

In this book all the foundation and derivative weaves for harness looms are systematically classified and explained.

The weaves are divided into three general classes, plain, twill and satin. Under each of these divisions are given rules for constructing derivative weaves, which are illustrated with over Five Hundred Drafts, Diagrams and Illustrations of cloth samples.

For self-instruction the workers in the mill find it of great value and, as a book of reference it is equally well adapted for the practical weaver, designer and the superintendent.

There are over Five Hundred Illustrations and Diagrams, many showing the cloth with weave construction.

Over One Hundred Pages. Handsomely Bound in Green Cloth and Gold. Price, $1.00.

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299 Devonshire St., Boston.

Worsteds.

Blue	16-18
Black	21-23

Serges.

New black	16-18
New blue	15-17

Flannels.

New scarlet	19-20
New blue	15-16
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	10-11
Old white flannels	22-23
White flannels, No. 2	11-12
Old red flannels	12½-13
Light blue flannels	7½-8½
Old blue flannels	9½-10
Fine worsteds, new black	
Old plaids	7-8½
White stockings	22-23
White hood stock	22-24
Clear hoods	9-10
Red stockings	12-13
Blue stockings	8½-9½
Fancy stockings, No. 1	9½-11
Gray stockings	10½-11
Black stockings	10½-11½
Knit stock comforters	7-8
Red knit	12½13
Light gray knit	10½-11
New light fancies	14-15
New fancies	11-12

Merinos.

Light, fine	16-18
Light, coarse	8-9
Fine, dark	13-15
Coarse, dark	8-8½
Blue	11-12
Blue—seamed	
Black—seamed	15-16
New black	18-20
Small	4½-5
Bunting	7-10

FLOCKS.

Shear, fine white, all wool	10-12
Fine indigo blue, all wool	7-8
Fine black, and blue, all wool	6-7
Fine dark, all wool	2½-4
Gig, fine, all wool	2-3
No. 1 black, all wool cut	6-10

COTTON WASTE.

No. 1 Spinners	10-10¼
No. 1 Machine	6¼-6½
No. 2 Machine	5-5½
Machine Cop	9-9½
No. 1 Cop	8¾-9
No. 1 Card	8-8½
No. 2 Card	7½-8
No. 1 Oily Card	5½-6
No. 2 Oily Card	4-4½
Peeler Combing	10-10¼
Egyptian Combing	10-10¼
No. 1 Linters	5½-6
No. 2 Linters	4½-5
White Clips	4½-5
Colored Clips	1½-2¼

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The question of rope drives should have the consideration of the manager of every plant that uses any considerable amount of power.

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Acetic, 100 lbs.	2.60-4.05
Citric, domestic	38-38½
Oxalic	5-5½
Sulphuric, 60 deg., 100 lbs.	1.10-1.30
Muriatic, 18 deg.	1.50-1.60
Tartaric crystals	29-29½

Miscellaneous Chemicals.

Acetate of lime, gray, 100 lbs.	2.35-2.40
Alum, lump	1.75-1.85
ground	1.85-1.95
powdered	3.00-3.25
Aqua ammonia, 16 deg.	3¾-4
Ammoniac, sal., gray	6-6⅛
Borax, bbls.	7¾-8
Brimstone, crude, foreign ton	22.25-22.75
Copperas	57½-62½
Cream tartar, crystals	23½-23¾
Fuller's earth, lump, 100 lbs.	80-85
powdered	80-85
Glauber's salt	40-50
Potash, chlorate, crystals	8½-9½
powdered	8¾-11
carbonate	3¾-4¼
Soda ash, carbonate, 48 per cent.	1.20-1.30
high test	1.00-1.25
Soda, bicarbonate, English	
American	1.30-1.70
Soda, caustic, domestic, 60 per cent.	1.85-1.90
Sal. English	85-90
Sal. American	60-70
Sulphate, alumina	90-1¾
Vitriol, blue	5¾-6

Dyestuffs.

Acetate of soda	4¼-4½
Acid, picric, best crystals	22-27
tannic, commercial	35-37
Albumen, egg	54-70
blood	20-27
Alizarine, red	15½-16½
Aniline oil	10-10¼
salt crystals	8⅝-8¾
Antimony salt, 65 per cent.	14-15
Bichloride of tin, 50 per cent.	10¼
45 per cent.	9¾
Bichromate of potash, American	8¼-8½
Bichromate of soda	6¼-6½
Bisulphate of soda	80-1⅜
Cutch, mat	4½-5
boxes	5-7
Dextrine, imported potato	6½-7½
corn	2.55-2¾
Divi-divi ton	35.00-40.00
Flavine	23-40
Fustic, stick, ton	18-20
young root	31.00-35.00
Gambier	4¼-4½
Hypo. of soda, Am. bbls. cwt.	1.40-1.50
Indigo, Bengal, low grade	52½-55
medium	60-65
high grade	75-85
Kurpah's	47½-60
Gautemala	35-70
Manila	43-45
Madras	42-45
J. (Synthetic)	18-20
Indigotine	95-1.80
Logwood, stick, ton	15.00-19.00
roots	14.00-16.00
Madder, Dutch	7⅝-10⅛
Muriate of tin, 36 degrees	9-9¼
52 degrees	15-15¼
Nitrate of iron, commercial	1¼-1½
Nutgalls, blue Aleppo	23-25
Persian berries	7
Phosphate of soda	1.90-2¼
Prussiate of potash, yellow	14
Quercitron, ton	18.00-20.00
Starch, corn, pearl, bbls.	1.90-2¾
corn, pearl, bags	1.75-2½
potato	3¾-4
rice	6½-7½
wheat	5-6
Stannate of soda	10-20
Sumac, Sicily, No. 1, ton	47.00-50.00
Sicily, No. 2, ton	43.00-45.00
Tapioca flour	2¼-3½
Tin crystals	21-22½
Tumeric, Madras	4½-4¾
Zinc dust	5¾-6

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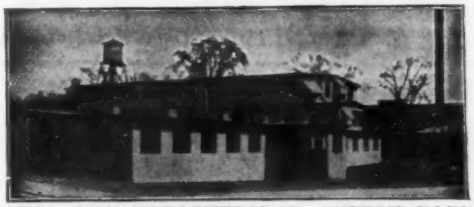

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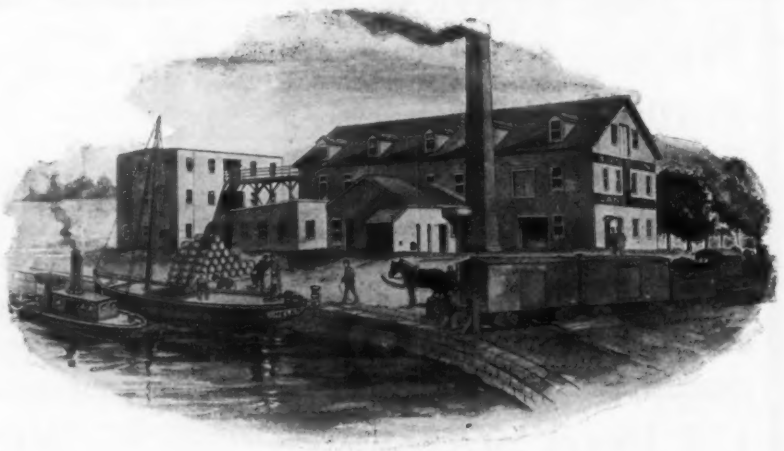

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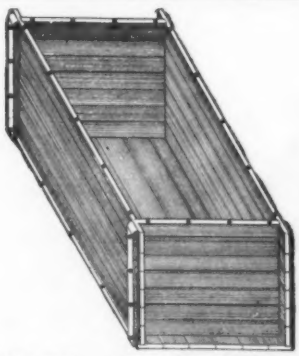

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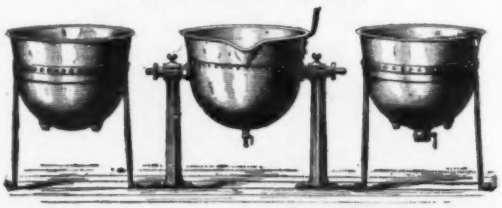

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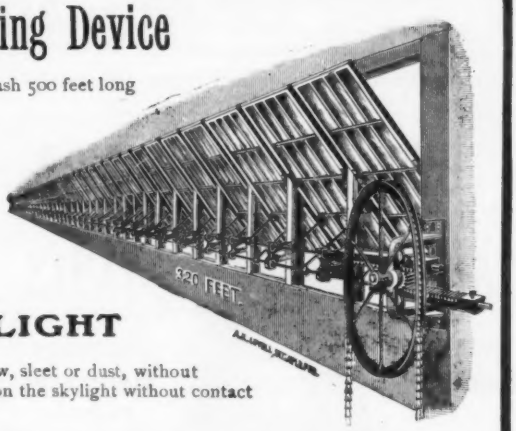

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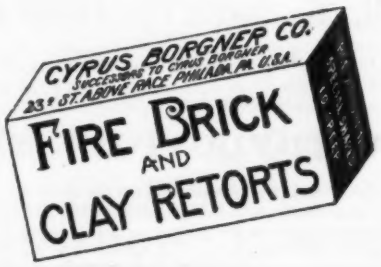

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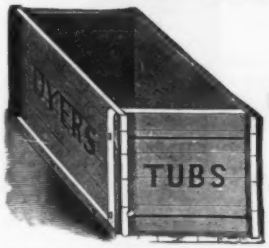

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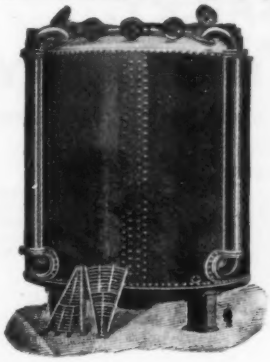

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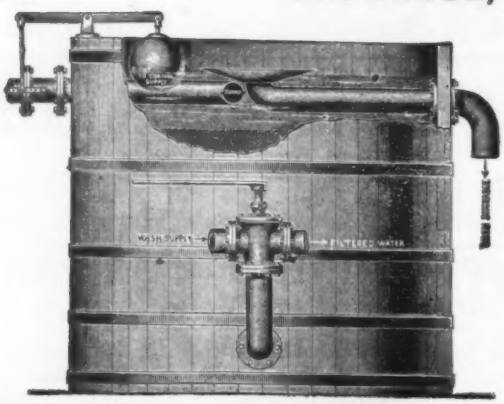

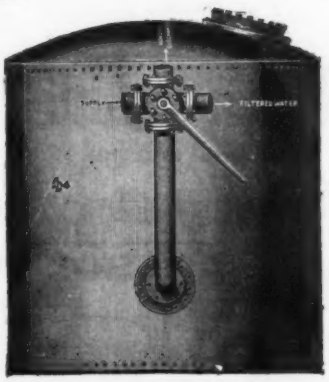

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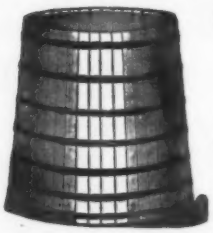

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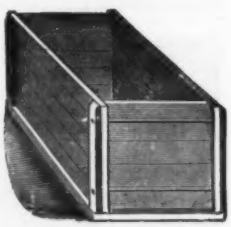

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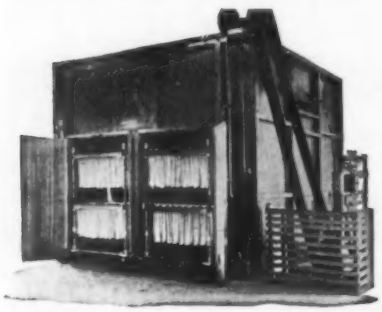

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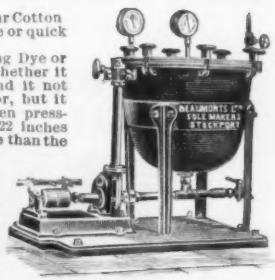
This machine will dye large, hard twisted, twine cops. It will dye or bleach any size of cotton cops. It will scour wool or worsted cops, cheeses and tops. It will scour or dye waste cops. This is a good machine to work in conjunction with the Vacuum and Pressure Machine for washing off, etc.

Vacuum Machines made	No. 1	No. 2	No. 3	No. 4
of Copper and Brass	£30	£45	£85	£130
Machines made of Iron	28	38	65	90

This machine will Dye, Bleach, Size and Scour Cotton Hemp, Woolen, etc., in the form of Cop, Cheese or quick traverse bobbins, any thickness or length.

This Machine will circulate absolutely boiling Dye or Size Liquor through every fibre of the yarn, whether it be cop or cheese which is under treatment, and it not only circulates this boiling Dye or Size Liquor, but it forces it into the fibre of the yarn under an even pressure of 10 lbs., and this is more than equal to 22 inches of vacuum; it is **three times** more effective than the ordinary Cop Dyeing Machinery.



This machine will dye evenly and thoroughly through every fibre of the Cops while the spare Cop plate is being refilled with Cops; **in fact it will do this in six minutes.**

Can be depended upon to dye a perfectly even shade all through the yarn, and will dye the most delicate colors. It will dye silk Cops or treat them with any necessary liquor. It will scour or dye wool tops. It will scour or dye large hemp cops and cheeses. It will scour and dye waste cops. We are the Patentees and Sole Makers.

Machines made of Copper	No. 1.	No. 2.	No. 3	No. 4.
and Brass . . .	£40	£65	£115	£170
Machines made of Iron .	35	50	75	110

We supply Two Sets of Skewers and Two Cop Plates with the Machine, whether it is for Weft Cops, Twist Cops or Cheeses.

BEAUMONT'S LIMITED, Brinksway, Stockport, England.

DYEING MACHINES

JOHN W. FRIES

WINSTON-SALEM, N.C.

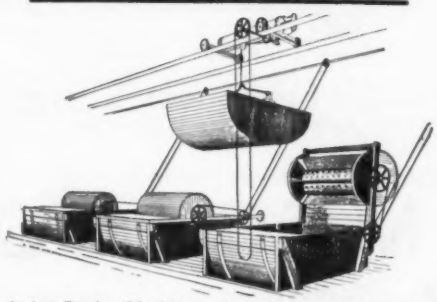
Smith, Drum & Co.

2503-9 CORAL ST., PHILA., PA.

Dyeing Machinery

FOR WARPS AND PIECE GOODS

Bleaching Machines



Circulating Dyeing Machines. For Hosiery, Underwear, Raw Stock and Rags. Singeing Machines for Hosiery. Mercerizing Machines.

THE COHNEN

CENTRIFUGAL

Dyeing Machine

U. S. Patent 776,295, Nov. 29, 1904.

Dyes Raw Stock

or

Yarn in Cops, Skeins or Bundles (Warps)

DYES SULPHUR COLORS

without bronzing or streaking and leaves the stock in perfect condition for carding or weaving.

ONLY ONE HANDLING

is required to dye, oxidize and hydro extract ready for the drying room.

The Machine may be seen in operation by applying to the American Agents.

A. KLIPSTEIN & CO., 122 Pearl St., NEW YORK.

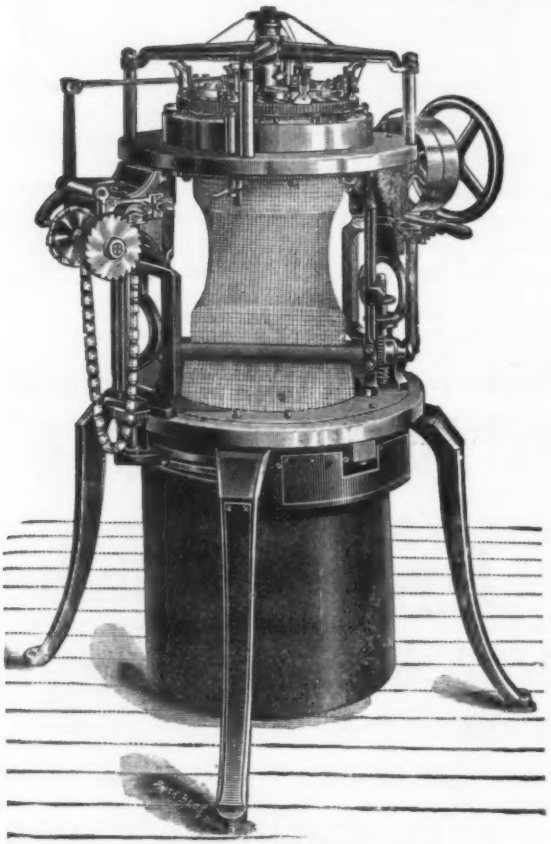
WILDMAN MANUFACTURING COMPANY

(Formerly McMichael & Wildman Mfg. Co.)

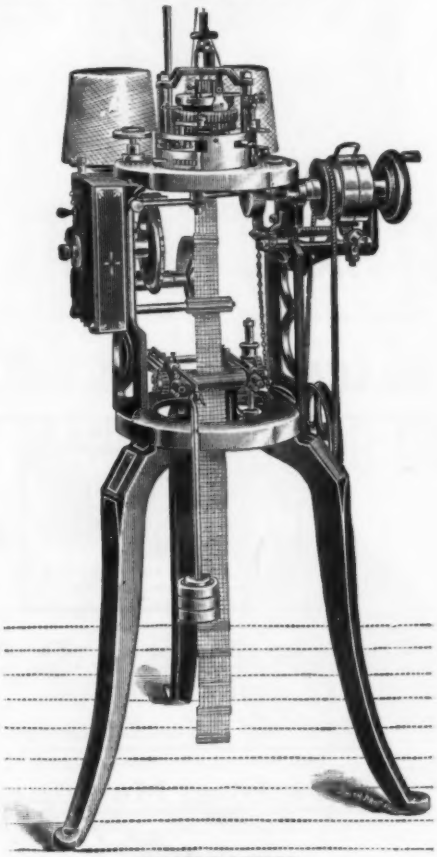
CIRCULAR RIB KNITTING MACHINERY

AUTOMATIC AND PLAIN

For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.



AUTOMATIC BODY MACHINE.



HOSIERY RIBBER.

ESTABLISHED REPUTATION FOR LARGEST PRODUCTION, BEST QUALITY FABRIC, DURABILITY, ECONOMY OF OPERATION

Full Particulars, Description and Samples Furnished upon Application to the

WILDMAN MFG. CO.

NORRISTOWN. PENN.

FLAT KNITTING MACHINES

OF

TWO LEADING MANUFACTURERS.

Schubert & Salzer

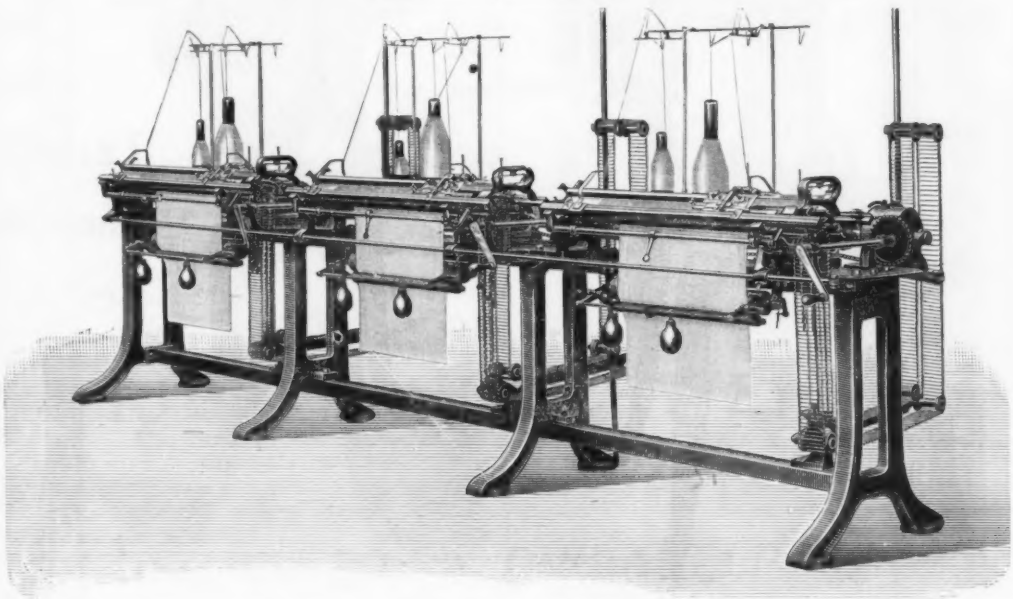
(Spring Needle)

For manufacturing full-fashioned hosiery and underwear, in cotton, lisle or silk in all gauges from 14 to 30 needles to the inch.

Seyfert & Donner

(Latch Needle)

For manufacturing sweaters, blouses, cardigan jackets, shaker articles, etc., by hand or on full automatic power machines.



This cut represents a Seyfert & Donner full automatic power machine with three INDEPENDENT heads, with chain drive. This machine has four automatic thread carriers, by which three-colored articles can be made, leaving one carrier for the dividing thread, automatic lock, racking arrangement for whole or half revolutions and electric stop motion. Each head on this stand can have needle beds of different width and guage.

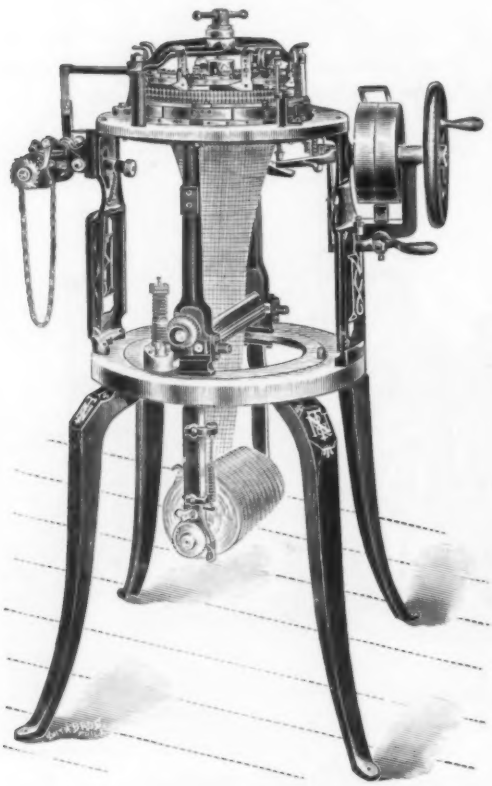
OTTO WALTHER, 507 Bourse, Philadelphia, Pa.

NYE & TREDICK CO.

Circular Rib Knitting MACHINERY

For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. : ; :

Correct Construction. Excellence and Durability.



LATEST IMPROVEMENTS
QUALITY OF FABRICS AND PRODUCTION
UNEXCELLED

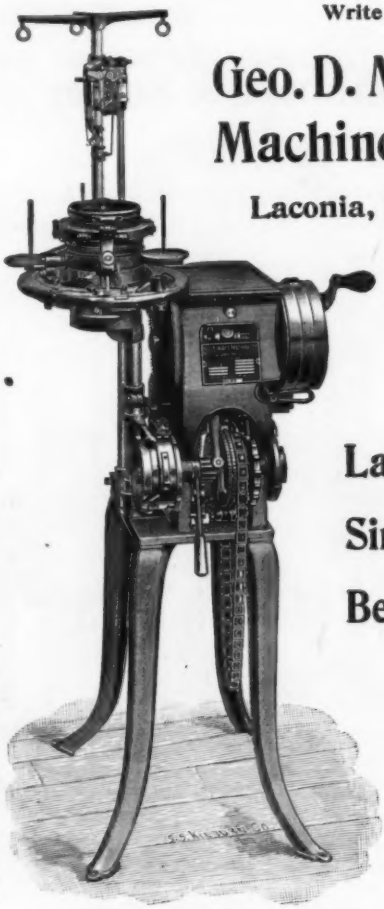
NYE & TREDICK CO.
606 Arch St., PHILADELPHIA, PA.

If You Want

Largest Production For Least Money

Write

Geo. D. Mayo Machine Co.,
Laconia, N. H.



Latest
Simplest
Best

MAYO'S

New Full Automatic Knitter.

PHILADELPHIA OFFICE,
KNICKERBOCKER BLDG., COR. SIXTH AND ARCH STS.,
B. M. DENNEY, REPRESENTATIVE.

Friedberger-Aaron
Mfg. Co.'s
Braids and Laces

The recognized

Standard Finish

for

Trimming Ladies'

RIBBED UNDERWEAR

GERMANTOWN, PHILADELPHIA

P. O. Address, Logan Station.

JAMES TAYLOR,

835 Arch Street, - - - Philadelphia, Penn.

KNITTING MACHINERY

OF ALL KINDS. NEW AND SECOND HAND.

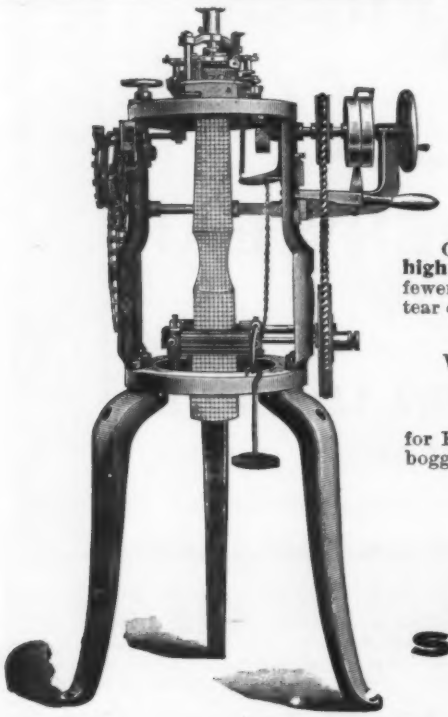
A RARE OPPORTUNITY TO BUY.

500 Payne bobbins.
1 Payne 12 spindle skein winder.
1 Bruce band folder and cutter.
20 Scott & Williams ¾ aut. knitters, 176 needles.
35 Jenckes Invincible 176 n. machines.
1 Weston & Dennis Press, 32x40 in., }
15 Hollow Plates. }
Lot hosiery stamps, boards, etc.
38 Beattie & Hepworth & Abel loopers.
6 Hosiery presses (lever).
14 Lamb and Grosser sweater machines.
200 Ribbed underwear machines, various sizes.
50 Brinton & Co. ¾ aut. knitters, sizes.
24 Standard B machines, 200 and 160 n.
50 Union Special machines, various styles.
1 Rotary fire pump.
100 feet woven rubber hose, 3 inches dia.
33 Mayo machines. Various sizes.
100 Brooks welters.
4 Fleecing machines. (Nappers.)
98 Brinton & Co. and other make hosiery ribbers.
40-Ribbed shirt machine cylinders and dials, all sizes, cuts and makes.
4 Lindsay & Hyde winders.
2 Grosser Jacquard machines for gloves.
1 Cyclone dryer.
2 Typewriters.
5 Band folding and cutting machines.
4 30-inch ventilating fans.
1 Small Water Motor.
1 Small Steam Pump.
1 Small Belt Pump.
15 Rudolph Seaming Machines.
10 Steam Radiators,

WRITE FOR COMPLETE LIST.

APPRAISEMENTS A SPECIALTY.

We are always in the market to buy good second-hand Knitting and Finishing Machinery.



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at very **high speed**, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

STAFFORD & HOLT,

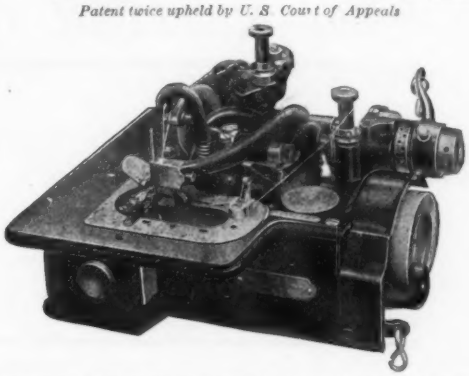
LITTLE FALLS, N. Y.

AN INSTRUMENT OF PRECISION!

"OVERLOCK" MACHINE

(Trade Mark) (Pat. April 5, 1892)

Patent twice upheld by U. S. Court of Appeals



Trade Mark

WILLCOX & GIBBS SEWING MACH. CO. NEW YORK

Business Established in 1859.

For TRIMMING, SEAMING (or Hemming or Overedging) and COVERING Raw Edges of Knit Underwear and Hosiery in **ONE OPERATION** at **3000 Perfect Stitches per Minute.**

WILLCOX & GIBBS SEWING MACHINE CO.,

General Offices: 658 BROADWAY, cor. BOND STREET,

NEW YORK, N. Y.

LONDON PARIS MILAN DRESDEN NOTTINGHAM

THE GROSSER KNITTING MACHINE CO.

WOOL EXCHANGE Rooms 400-421

MAX NYDEGGER

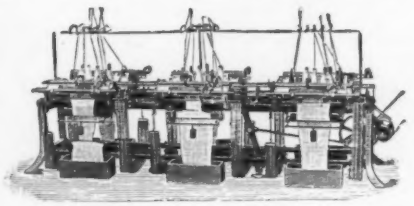
260 W. Broadway NEW YORK

SPECIAL MACHINES

FOR ANY ARTICLE THAT IS KNIT

GROSSER Flat Knitting Machines

For HAND power or **Fully Automatic Power Machines.** Most productive and best machines for Sweaters, Jackets, Blouses, Wool Hosiery, Gloves, Mittens, Sporting Goods in Plain, Fancy and Jacquard Work, Shaker Articles, etc. Large stock on hand. Power Machines to be seen in operation.



COTTON PATENT HOSIERY MACHINES

Built by **H. ALBAN LUDWIG, Chemnitz,** for automatic production of **Full Fashioned Hosiery, Fine Half Hose, Ladies' Lace Hose, Fine Underwear;** high speed, large production. All gauges and any number of sections, from 2 to 24.

FRENCH FRAMES

C. TERROT SÖHNE, Cannstatt, Würt, famous builders of the best Circular Frame for **Finest Underwear, Fleece Linings, Gloves, Special à-jour** (open work) **Fabrics, etc.**

RASHEL MACHINES

For Fancy Goods in largest variety, **Shawls, Capes, Caps, Borders, Fringes, Lace Work, etc.,** in silk, wool, cotton.

SPOOLERS, Paraffiners, Finishing Machines, for the knitting business.

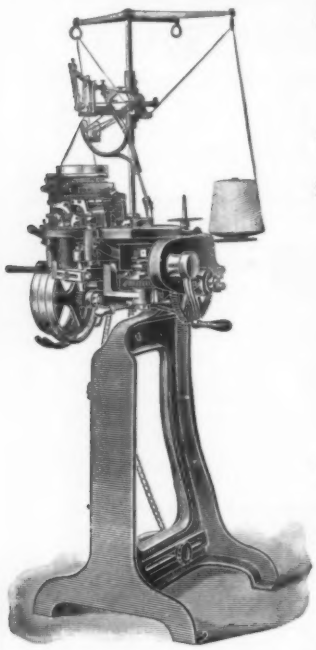
SPECIAL OVERSEAMERS, "Julius Köhler"

Indispensable for Full Fashioned Articles, Sweaters, Hosiery, Gloves, Sporting Goods. **Loopers,** self-cutting and cleaning.

Largest Stock in NEEDLES

For Knitting Machines. Best IMPORTED quality. All parts, accessories, etc., delivered immediately from stock.

Samples, Special Offers, Prices, etc., upon application.



Also Furnished for Bench.

The Invincible

"The KNITTER that KNITS"

THE LARGEST PRODUCER OF PERFECT WORK.

SIMPLE, POSITIVE AND EASY TO OPERATE.

E. JENCKES MFG. CO.

Pawtucket, R. I.

R. M. OATES, Hendersonville, N. C., Southern Representative.

PHILADELPHIA OFFICE, 101 North Sixth St.

The Merrow

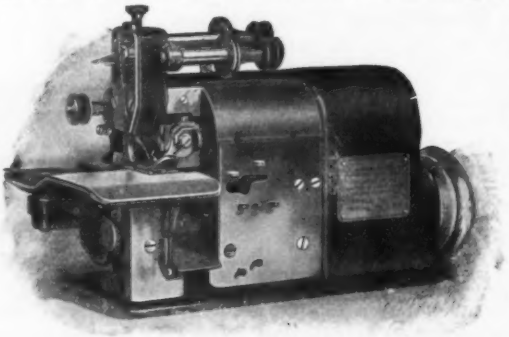
High Speed Overseaming, Overedging and Scallop Stitch Machines

are LIGHT RUNNING, FAST and DURABLE.

OUR NEW STYLE 60 MACHINE for Trimming and Overseaming in one Operation produces the strongest, best Seam and does it with the greatest economy.

STYLE 35 B SHELL MACHINE

For Necks and Fronts of Rib Goods, produces the most showy, substantial finish.



USE STYLE 17 or 22 for Bed Blankets and STYLE 18 for Horse Blankets.

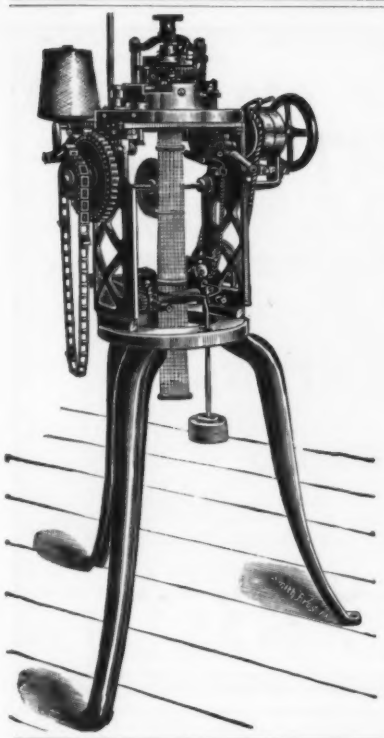
Send for Catalogue and Samples.

THE MERROW MACHINE CO.

Knickerbocker Building, Sixth & Arch Sts., Phila.

HARTFORD, CONN.

346 Broadway, New York



H. Brinton & Co.

213-215 Race Street, Philadelphia, Pa.

BUILDERS OF

Knitting Machinery

For HOSIERY and UNDERWEAR.

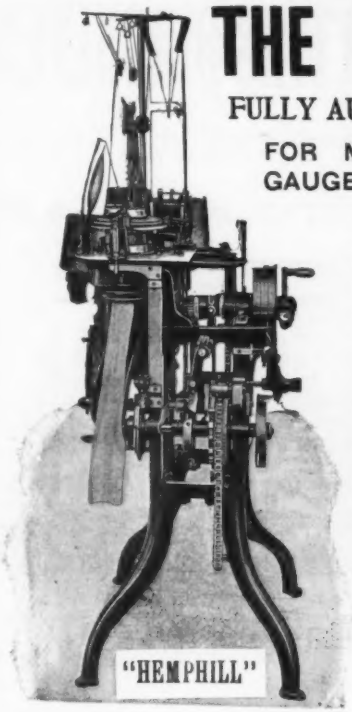
Complete Estimates Furnished. Send for Particulars.

The cut shows our **Improved Automatic Ribber** with Welt and Slack Course for Half Hose, Tops and Ribbed Legs.

THE TWO LEADERS

FULLY AUTOMATIC HOSIERY KNITTERS

FOR MAKING ALL KINDS AND GAUGES OF SEAMLESS HOSIERY



One with **GEARS**, the other with **CHAIN** for pattern mechanism, to meet the various tastes of different manufacturers.

Both used and approved by leading hosiery manufacturers.

Both contain all the well-known essentials demanded of first-class knitting machines.

With these two machines we can supply all manufacturers' possible wants in the best possible manner.

Write us for further particulars and prices.

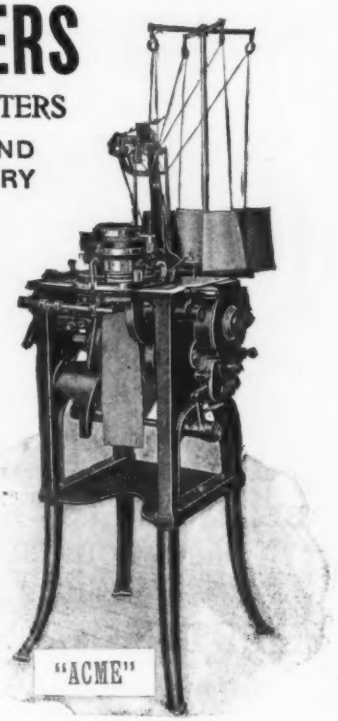
We also make all kinds of **LATCH NEEDLES.** Many leading manufacturers use our needles and say they are the best on the market. Send us a trial order.

MAYO

Knitting - Machine and Needle Co.,

FRANKLIN FALLS, N.H.

Philadelphia Office, Knickerbocker Bldg., Cor. 6th & Arch Sts.



EXCELSIOR KNITTING MACHINE MFG. CO.

BUILDERS OF

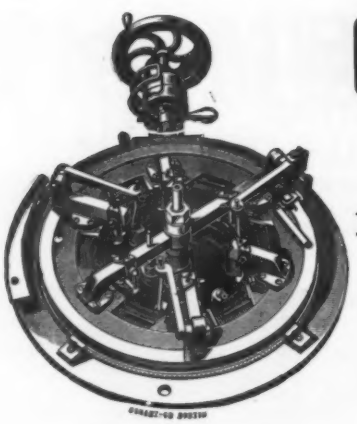
Full Automatic Knitters

WITH OR WITHOUT

Transferring Device

ALL SIZES AND GAUGES, 2 1-4 INCH TO 4 INCH

MEADOW AND WASHINGTON STREETS ALLENTOWN, PA.

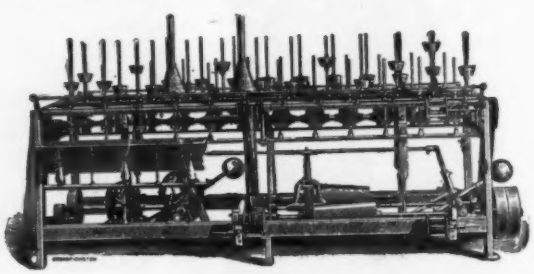


CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete. 4 to 24 feeds for

RIBBED UNDERWEAR

Automatic Racking and Striping Machines for Sweaters, Cardigans, Collarettes, Cuffs and Anklets.



ALSO BUILDERS OF THE WELL-KNOWN

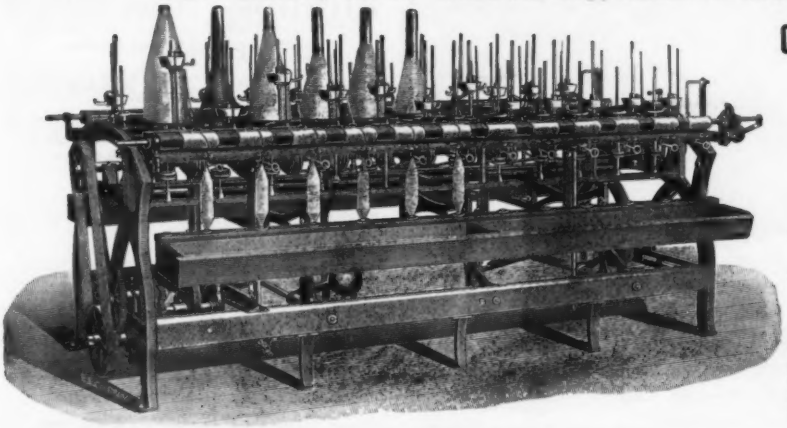
ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO., - Manchester, N. H.

GEO. W. PAYNE, Prest. J. MILTON PAYNE, Treas. CLINTON F. PAYNE, Sec'y.

OVER 1,650 PAYNE WINDERS IN USE

For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



GEO. W. PAYNE CO.,

[Est. 1865. Inc. 1903.]

Builders of the

Improved

Upright Spoolers,

To Spool from Cop, Skein or Bobbin.

Doubling Spoolers, for doubling 2, 3, or more ends into one,

Upright Quillers, Quill from Cop, Skein or Bobbin.

Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler, Guides, Bolsters and Stops Made and Repaired at Short Notice.

OFFICE, 102 BROAD STREET

Pawtucket, R. I.

WILLIAM C. BULL, BENNINGTON, VERMONT.

For Ladies', Gents', and Children's Goods.

LATEST STYLES.

BEST WORKMANSHIP.

MAKER OF

Drying Form Boards

OF EVERY VARIETY.

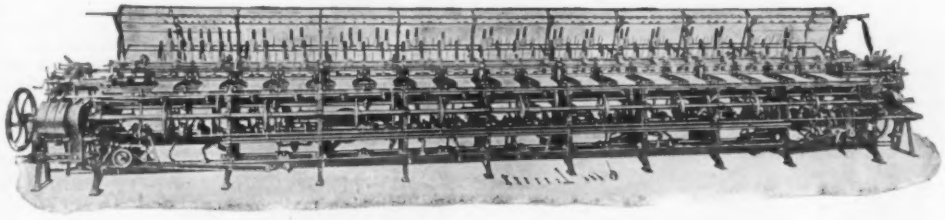
WORKS: CHEMNITZ, SAXONY. Established 1851.

G. HILSCHER

Full-Fashioned Hosiery and Underwear Machine Builder

Sole Agent for United States and Canada

EDWARD W. KOCH, 319 Bourse Building, Philadelphia, Pa.



"Awarded Gold Medal at World's Fair, Paris, 1900,

for highest improvement in the mechanism of manufacturing full-fashioned hosiery, solidity and perfect workmanship in construction and superiority of fabric produced."

SPECIALTIES:

COTTON-HILSCHER HIGH SPEED SYSTEM, 65 courses per minute.

COTTON SYSTEM, for horizontal stripes up to 6 colors, Scotch plaids and vertical stripes, lace through the narrowing, split, etc., etc.

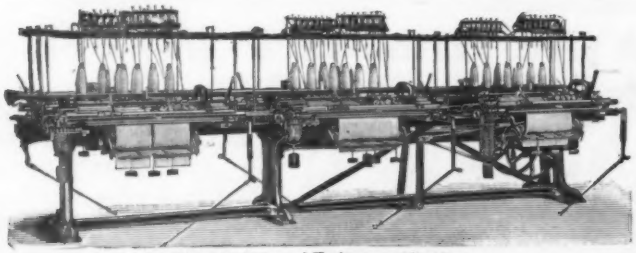
COTTON SYSTEM, wedge heel; this machine manufactures entire full-fashioned ladies hose or half hose and dispenses with the foot machine.

COTTON SYSTEM, newest construction. The new machine knits the entire hose or half hose complete down to the toe, it makes French heels and French feet.

RIB MACHINES: Cotton System, with and without narrowing.

RIB MACHINES: Hilscher System, high construction.

Machines can be seen in operation at above address.



Cardigan Jackets and Underwear Machine.

AUTOMATIC

Knitting Machines

For Plain and Fancy Goods.

THE BEST IN THE MARKET!

Special Constructions for different articles!

INDEPENDENT HEADS.

DOUBLE SYSTEM OF LOCKS.

Double-side Power Stands, 6 at once.

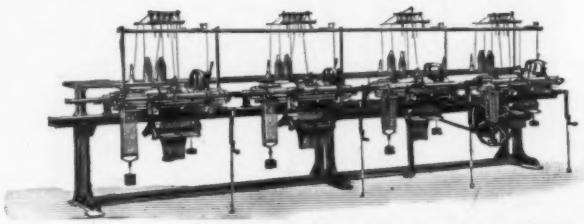
Paris, 1900, Gold Medal.

Ask for samples and particulars, state guage and size you want.

CLAES & FLENTJE,

Mülhausen, Thür, Germany.

Representatives: Ainslie Knitting Machine Co., Ainslie & Humboldt Sts., Brooklyn, N. Y., where all kinds of hand and power machines can be seen working.



Automatic Widening Machine for Sleeves, Drawers, Garments, Plain and Ribbed.

LEWIS JONES,

60½ and Media Streets, . . . PHILADELPHIA

GAS ENGINES for city or country
BRUSHING MACHINERY
KNITTING MACHINERY

} EFFICIENT DURABLE LOW IN PRICE

CRANE MFG. CO. Lakeport, N. H.

Spring Needle Circular

KNITTING MACHINE.

For Hosiery, Shirts, Drawers, Jersey Cloth and Stockinet.

A Specialty of Hardened Bladed Burr Wheels with Self-Oiling Brackets

CRANE MFG. CO.

SUCCESSORS TO

PEPPER MACHINE WORKS

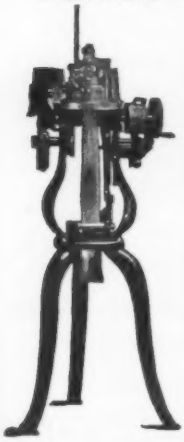
Lakeport, N. H.

Manufacturers of

Knitting Machinery,

INCLUDING

Pepper's Flat Ribbed Cuff Machines,



Automatic Welt and Loose Course Machines for Stock Tops. New Circular Stripers with Welt, Loose Course and Striping (Automatic), for Short Cuffs, Sock Tops, Hose Legs, Wristers, etc.

Golf and Bicycle Stocking Machines,

ALL KINDS OF

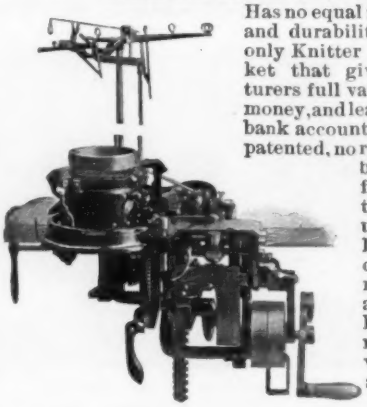
CIRCULAR RIBBED MACHINES

For Men's Underwear, Ladies' and Misses' Hose Legs and Leggins. Correspondence Solicited.

The New Improved

Boss 15/16 Automatic

KNITTER



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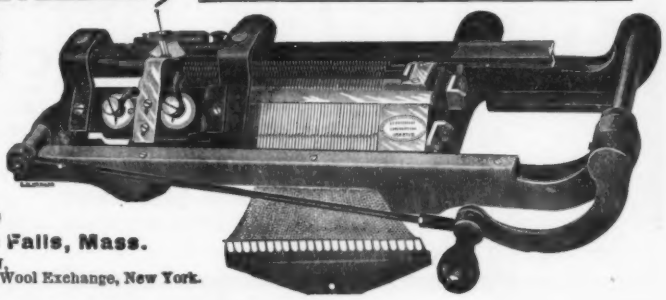

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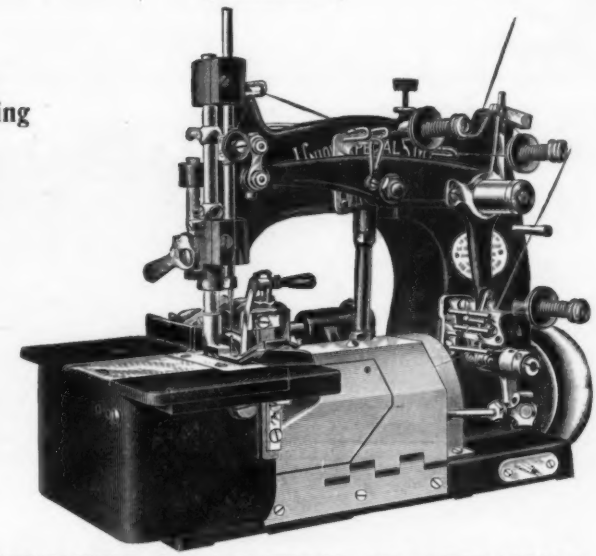

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Fabrics of Every Kind.

BY INCREASING PRODUCTION OF OPERATORS, THESE MACHINES REDUCE COST. EXPENDITURE FOR UNION SPECIALS ALWAYS MEANS A PROFITABLE INVESTMENT.

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With Lace Effects.

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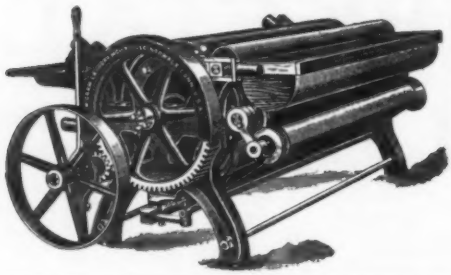

This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

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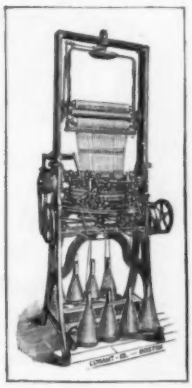

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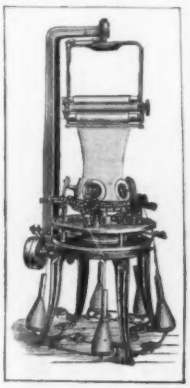
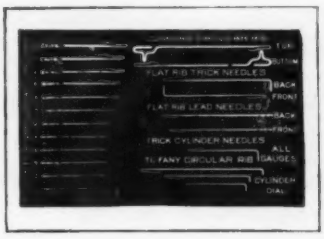
Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder.

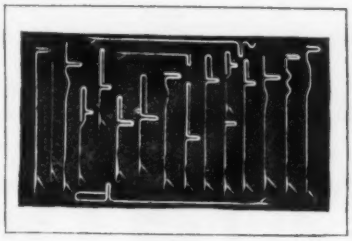


Spring Needle Cylinder Rib-Top Machines

For making Cuffs, Drawer Bottoms and Shirt Borders.



Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Sinkers, Jacks, etc.



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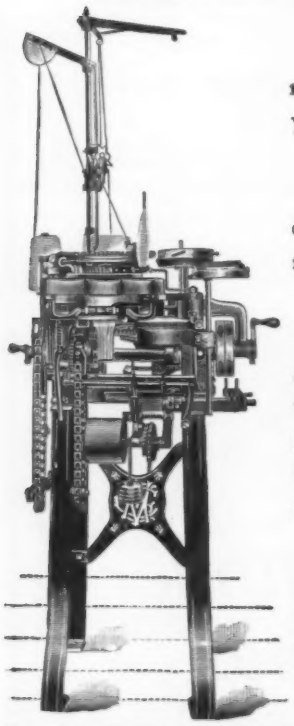
The Standard Hosiery Machine of the Trade.



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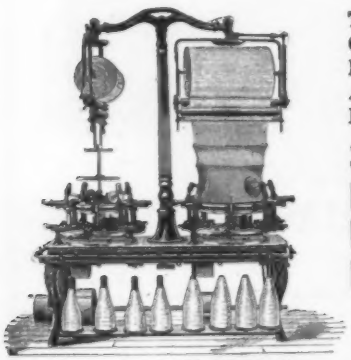

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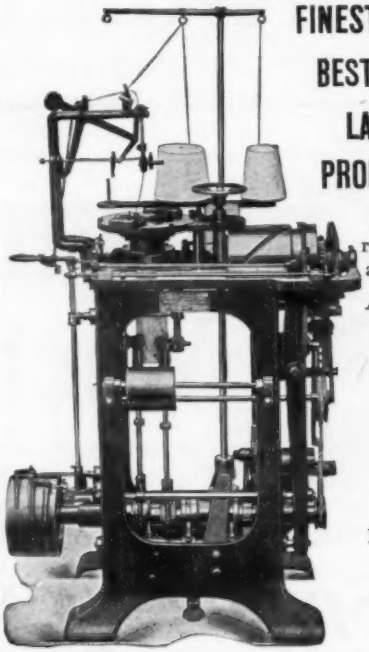

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Do you want to plait?

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This little Manual was prepared with the idea of telling briefly, but comprehensively, the things about the cotton fibre, its cultivation, and the ginning and marketing of the cotton crop, the different kinds of cotton, and other matters bearing on raw cotton, such as the average student or person connected with cotton manufacturing or the sale of cotton goods, wants to know.

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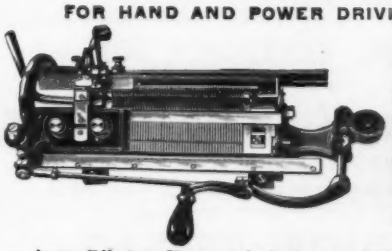

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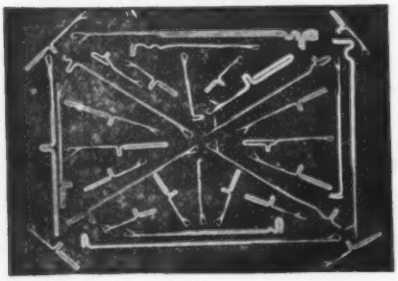

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The best Hosiery Needles in the market.
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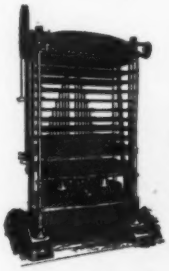

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The most reliable machine of the kind on the market.

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Established 1868.

KNIT FABRICS CUT TO LENGTH.

Our Knit Fabric Cutter

will cut from the roll, knit fabric into any length from 10″ to 40″ at the rate of 100 pieces a minute. The lengths are accurate, the waste is a minimum, the labor unskilled.

We also make a Slitter

for cutting these goods into narrow strips and rewinding same into rolls.

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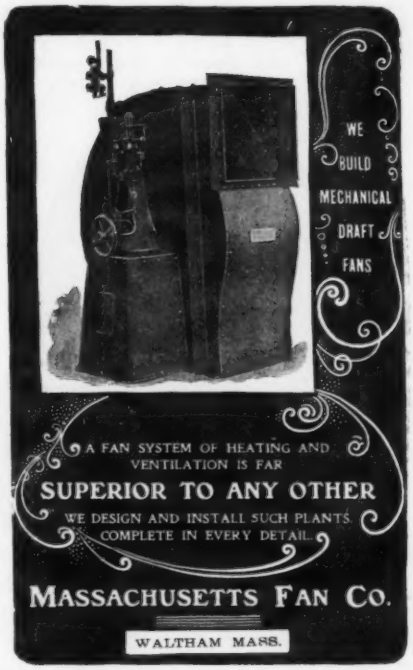
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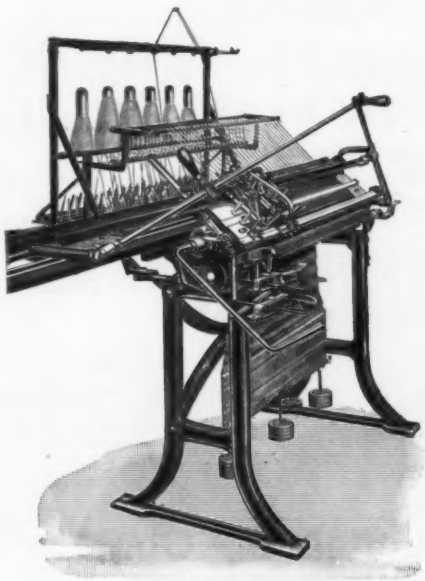

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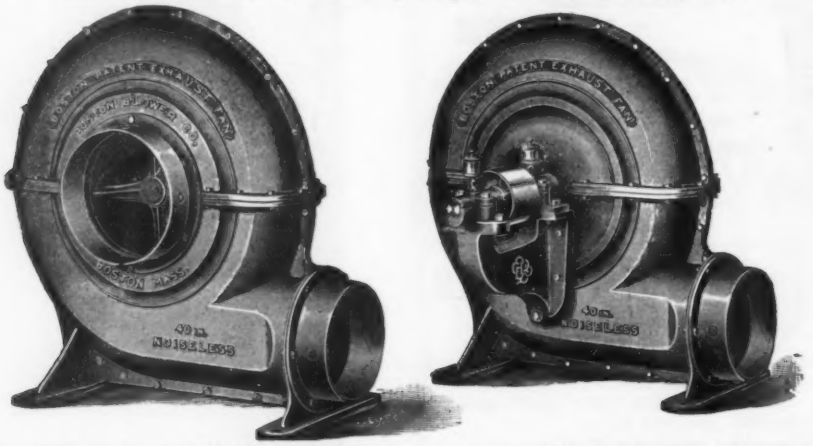
Specialty: Jacquard Machines

for hand and power driving for manufacturing of sweaters and every possible fancy article of that nature.

PRICE LISTS AND SAMPLE ON APPLICATION

Boston Wool Exhausters, with Removable Tops.

As used in Connection with Pneumatic Conveyor System for Handling Wool, Cotton, Rags, Excelsior, Jute, etc.



Inlet Side of Right-hand Wool Exhauster. **Pulley Side of Left-hand Wool Exhauster.**

This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

This latter feature is especially desirable when handling wet or greasy materials or in handling anything, in fact, which would leave a deposit on the inside of fan, as the entire top may readily be removed for inspection or cleaning without disconnecting either pipe or belt connections.

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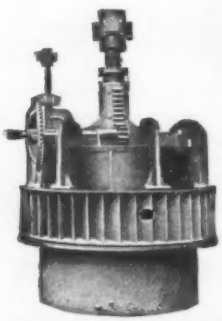

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MOUNT HOLLY, NEW JERSEY, U. S. A.

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On Horizontal or Vertical Shafts.

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SAMSON TURBINE

An EVEN and REGULAR SPEED under all CHANGES of LOAD makes the SAMSON especially desirable for driving all classes of machinery where the output must be UNIFORM in TEXTURE and QUALITY.

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LUBRICATED WITHOUT OIL PRESSURE

By Pump and Gravity Feed

In our TYPE A Engines a system of lubrication is employed which is far superior to forced lubrication or any other method now used. Let us tell you WHY

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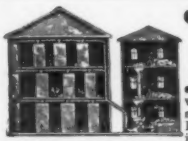

CHARLES H. SCHNITZLER,
Patentee and Sole Manufacturer of
THE PNEUMATIC CONVEYOR

For the handling of wool and cotton stock, rags, excelsior, jute and all kinds of fibrous material, wet or dry. Also spool elevators, steam heating and ventilating, and mill work generally. Blower and fan work a specialty. This conveyor is patented. Beware of infringement.

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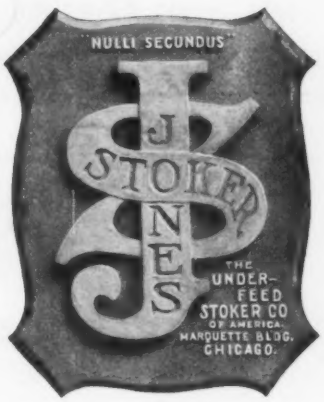

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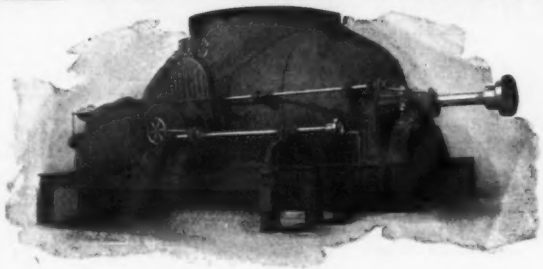

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Write for Catalogue if contemplating purchase of turbines.

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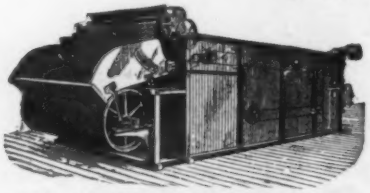
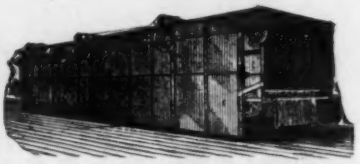
For Cotton Stock, Wool Stock, Rags, Yarn, Cloth, Underwear, Stockings, etc.



Automatic Cotton or Wool Stock Dryer.



Automatic Yarn Dryer.

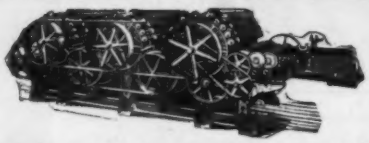
Steel Bladed Ventilating Fans.

Complete Carbonizing Outfits for Wool, Rags or Cloth.

IRON BOWL YARN SCOURING MACHINES.

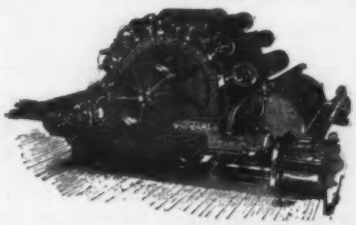
THE PHILADELPHIA TEXTILE MACHINERY CO.,

Hancock and Somerset Streets, PHILADELPHIA, PA., U. S. A.

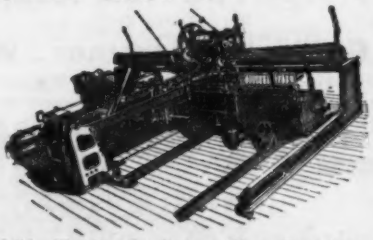


CARNETT MACHINES AND PICKERS

For reducing to Fibre Cotton and Wool Waste, Cloth Clippings, Etc.



WOOLEN MILL MACHINERY



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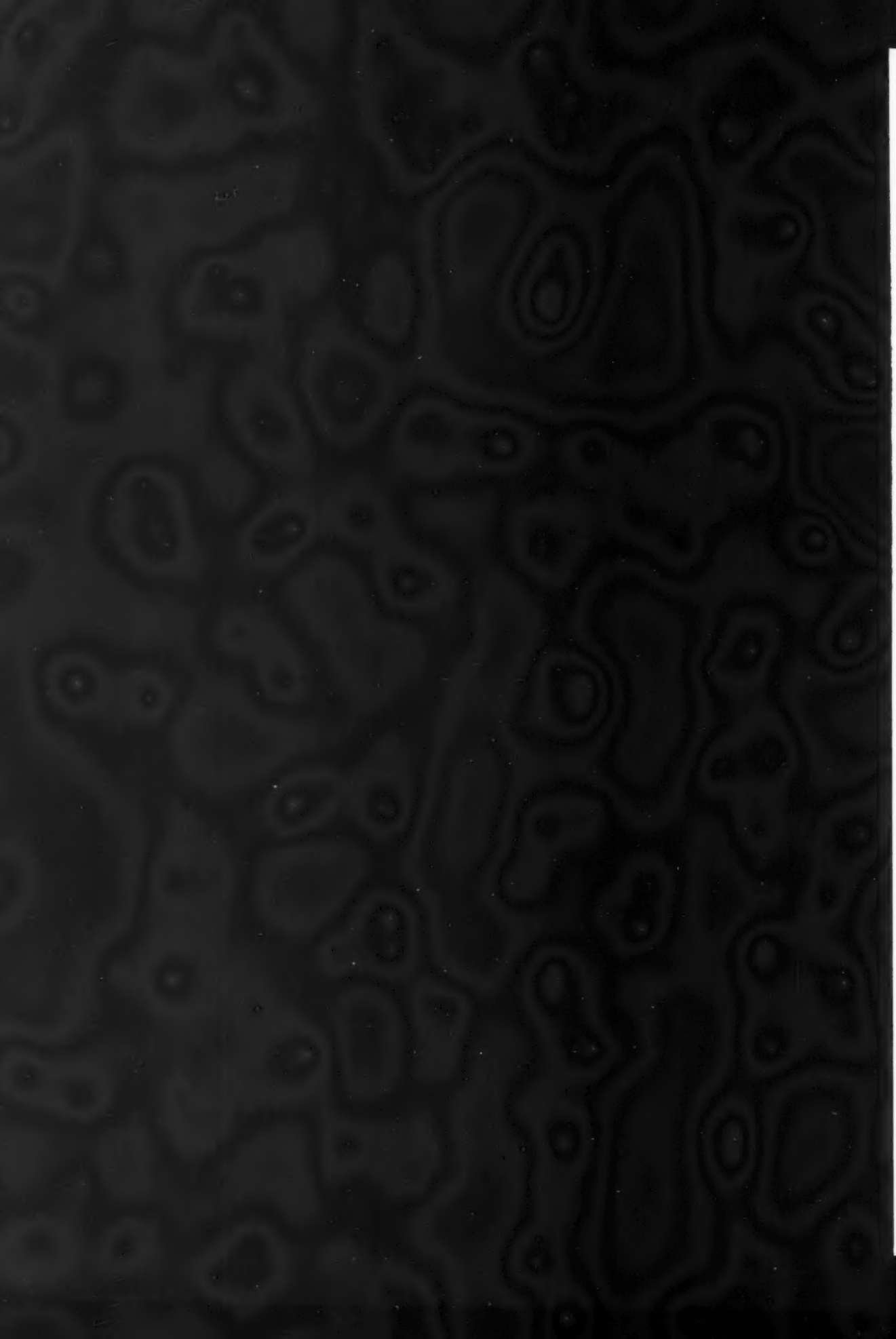

To Textile Manufacturers

We show below the three
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March Issue . . Forms close January 10th
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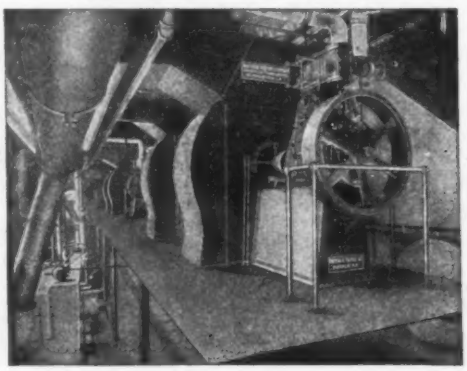

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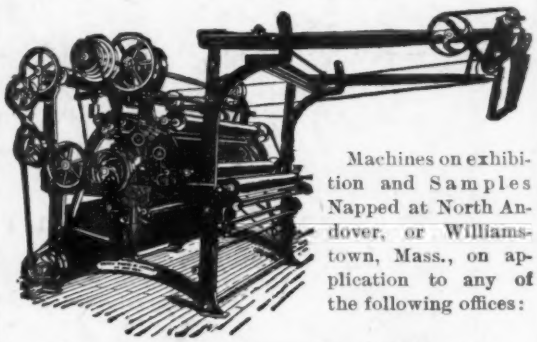

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